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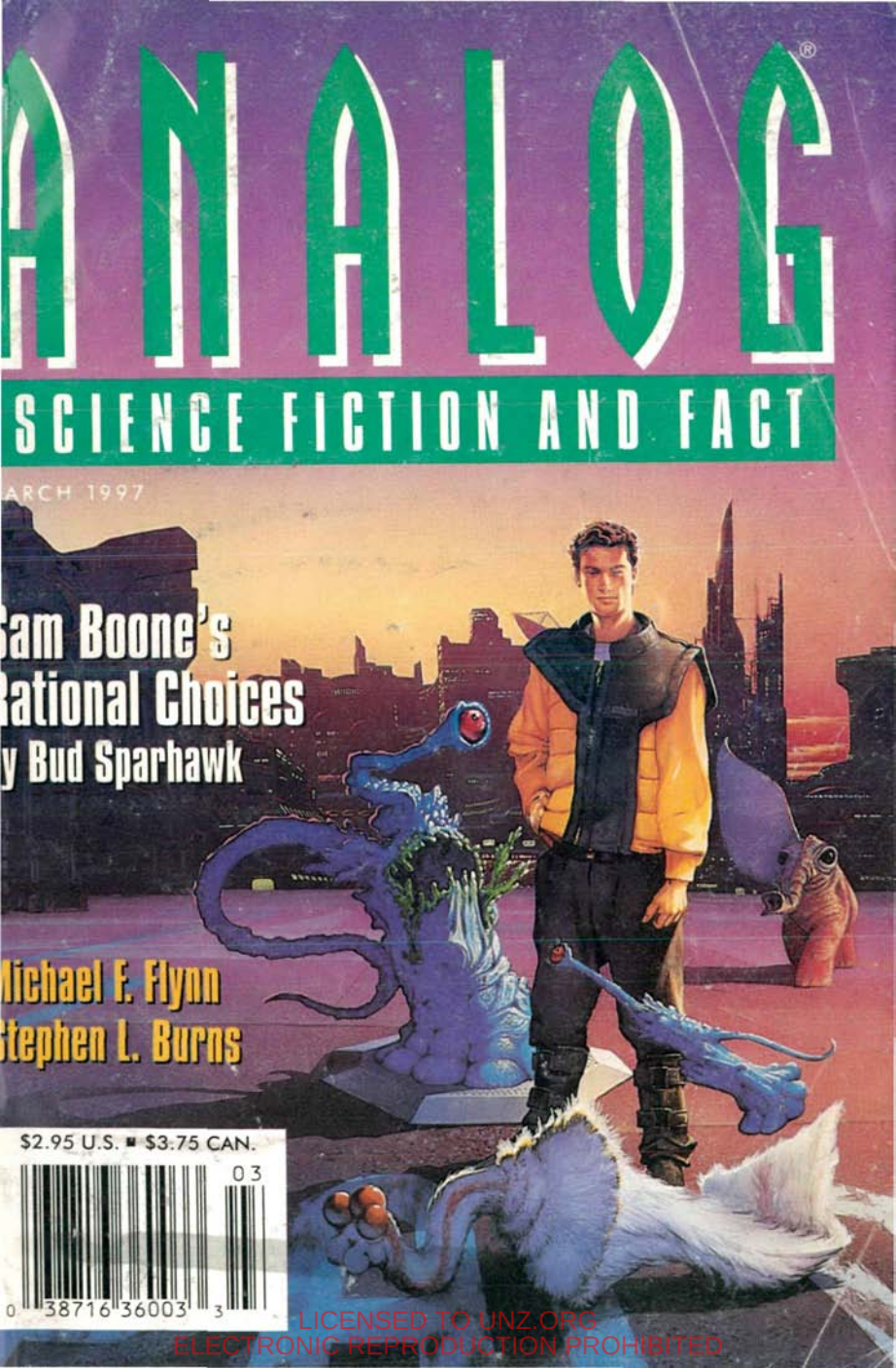

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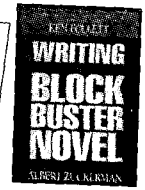

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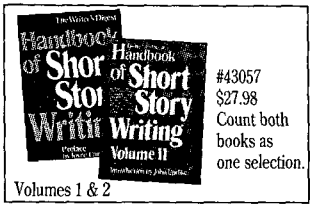

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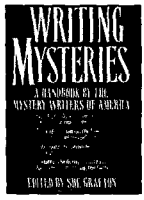

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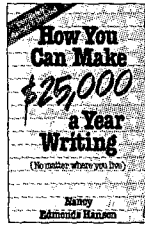

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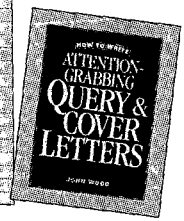

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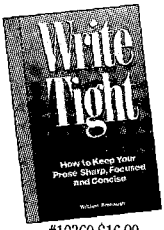

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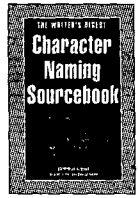

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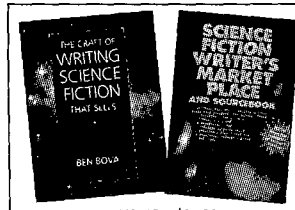

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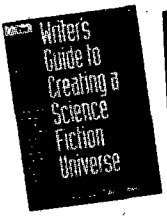

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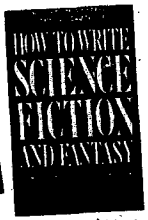

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STYLE AND SUBSTANCE, HORSE AND CART

A decade or so back ("Speak for Yourself," *Analog*, April 1985), I made the heretical suggestion that political campaigns should be conducted entirely by means of candidates explaining their positions *themselves*, in their own words, with none of the showmanship now generated for them by professional publicists, ad agencies, and speech writers. This was a response to the observation that elections these days are based less on what candidates think and can do than on how flashy their ad campaigns are.

It's still an idea worth considering, I think, but it probably doesn't go far enough. Even if a candidate *does* speak for himself (and I use "himself" throughout this discussion in the well-established sense of "himself or herself"), the content of his speech is likely to have far less impact than its delivery. And there are professionals willing and eager to coach him on *that*, too.

I was pointedly reminded of this while flying home from the 1996 World Science Fiction Convention. The in-flight magazine in the seat pocket in front of me contained an article by Marion Winik called "Welcome to the Sound-Bite Factory," about a "media training" business called "On Camera." And that contained this chilling tidbit: "We're all such sophisticated consumers of communication, inundated with molded messages and sculpted images, that it's really not OK just to 'be yourself' if you're in the hot seat. . . . Studies show that 93 percent of what a listener gets out of any communication has to do with the demeanor, appearance, and likability of the messenger . . . ; only 7 percent is the message itself."

Hence a booming business in "sound-bite factories," schools to teach politicians, corporate executives, touring authors, and so forth to glitz up their demeanor and appearance and project likability on camera and microphone. The article I read describes in considerable detail how one such school works, by describing the first-person experience of one individual who's been through the program and quoting others.

The experiences described are

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quite consistent with the underlying thesis that presentation is almost everything and content virtually nothing. (Abraham Lincoln wouldn't have had a chance in today's political marketplace!) The procedures described put all their emphasis on style; *nothing* is said about content.

Unfortunately, that 93 to 7 division of emphasis may indeed be an accurate description of how the American public evaluates what it sees and hears. If so, the "sound-bite factories" may indeed be effective in helping their clients to win elections, promotions, and impressive sales. Certainly they're a nifty way for the people running them to make lots of money.

But are they good for the *country,* or the larger civilization the country is part of? Or even the company or individual paying for the image-building service?

In the short term, and on a small enough scale, sure, they work. An author doing a book tour has no cause for complaint if taking one of these courses increases his royalties by more than the cost of the course. A politician has no cause for complaint if it helps him get elected. A business executive will surely rejoice if a slick presentation helps him get the board to approve his pet project instead of somebody else's.

But how do that author's *readers* fare if they buy the book on the basis of the hype and then find that it's a lousy book? What if the politician so elected turns out to be incompetent and/or crooked, and undermines a multitude of good works started by the less flashy incumbent he unseated? What if the executive's project is unsound and loses his company a lot of money, while the one it beat out could have *made* it a lot of money?

I think the answers to those questions are fairly obvious. What may be less obvious is that, in the longer run, even the individuals who triumphed through professionally cultivated glitz may suffer. There is, after all, that 7 percent of judgment based on content. If the author's book is bad enough, readers who were stung once may be harder to take in again—even if his next book is better. If the politician does enough damage, eventually enough voters might notice to turn him out. The executive may find it harder to sell his next scheme.

Of course, 93 to 7 is pretty good odds for style over substance. So it may take quite a while for any of those things to happen. Thus, on bal-

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ance, the alleged fact that people judge what they see and hear far more on presentation than on content, if true, represents a very serious problem. People who understand it and concentrate hard on presentation have an excellent chance of using it to get themselves into powerful positions, and then stay there long enough to do lots of damage.

It's been often (and rightly) said that one person's problem is another person's opportunity. If most people judge what they hear almost entirely on the basis of its presentation, that's a problem for *everybody*. It implies that we-as-a-culture are going to buy a lot of things that are bad for us, simply because they had slicker sales pitches.

But "everybody" is hard to reach. The style-to-substance judgment ratio is also a problem for individuals with something—whether a "how-to" book or a foreign policy—to sell: A "non-grabbing" style will make the sale more difficult. But such individuals are much easier to reach and deal with—and so the problem viewed this way is much easier to turn into an opportunity. If presentation is polished enough, content hardly matters. Individuals who recognize that fact can turn it to their advantage by learning to polish their presentation, and "sound-bite schools" can turn it to *their* advantage by helping them do so.

Which is all very well, at least in the short term, for Those Who Would Sell Something. The fact remains, though, that the far more important concern in the bigger picture is: Is what they're selling worth buying? Readers want books that they actually enjoy reading. Companies need products that actually satisfy customers and keep them coming back. Countries need policies

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and leadership that actually contribute to the well-being of their citizens.

And whether they get those things depends far more on content and substance than on style and presentation.

So I view the "sound-bite factory" phenomenon as putting its emphasis in a perversely wrong place—or, at best, as a very incomplete solution to the larger problem. Given the apparent reality that most people do judge far more on style than on substance, even people with excellent ideas and products may need the skills they can learn from such programs to get them accepted. To the extent that they can help that happen, I can (grudgingly) acknowledge and appreciate their value. At the same time, I can be very disturbed by the role they can play in helping people sell useless or destructive products, ideas, and policies.

The much bigger, and far more important, challenge is to make *that* less likely—and that won't be solved by expensive schools teaching a few well-heeled clients to make slicker and slicker sales pitches. The real challenge is to *change* that ratio: to train a far larger part of the populace to judge what they hear *not* almost exclusively by how it's said and how the person saying it looks, but primarily by what it actually *means* and how believable it is on the basis of its own merits. The justification for "sound-bite factories" I quoted earlier starts out by saying, "We're all such sophisticated consumers of communication. . . ," but I think the real situation is just the opposite. If we're so easily taken in by carefully cultivated posturing and mannerisms that content counts for almost nothing, we are terribly *un*sophisticated consumers of communication, and as such terribly vulnerable.

Let the sound-bite schools continue; as long as this situation persists, even those with something good to sell may need them. But what we need far more is *other* schools that will do everything in their power to immunize the general populace to the slick tricks of the "style over substance" crowd. We need schools that will teach *everyone* to see through the tricks, to cut past facades and think critically about what people are actually *saying*—and to judge them primarily by that, not by how they look or how glibly they speak.

The task of *those* schools will be, of course, far harder. They need to reach far more students—ideally, they should include every public and private school for general education—and many of those students will be far less motivated than those at the sound-bite factories. The work will be harder (any ideas on *how* to do it are eagerly solicited!) and financially less rewarding.

But I can't think of many jobs that more urgently *need* to be done. ■

Any fool can tell the truth, but it requires a man of some sense to know how to lie well.

—Samuel Butler

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"Dhammn vladish humms, nodgid nythggg ride!" Mardnnn bubbled. The words formed a greenish foam around the edges of the alien's air hole and dribbled over the bright orange pimple on his otherwise featureless "face."

Sam could tell that Mardnnn was obviously displeased, upset, and a bit indisposed, because the alien's normally deep bluish complexion had shifted toward a more cerulean hue. Besides that, the Crumptonian was rocking back and forth on his platform, and wiggling his tentacles in a most agitated fashion. All in all he could tell that his boss was quite distressed.

Like everything else connected with the galactics, this made Sam very worried.

A year before, humanity's first interstellar explorers had returned to Earth with astonishing news. Of course, the news was not nearly so astonishing as the lopsided, asymmetrical lump of a green ship that they rode into near-Earth orbit. The ship was a gift (aka "bribe") from the captain of a galactic liner that mistakenly rammed Earth's most sophisticated piece of technology and destroyed it. "Never to speak of this," the captain had pleaded as it stuffed the humans into their new ship, gave them instructions on how to get back to where they started. "Never to make a claim," it begged them, and raced away. Earth's first interstellar visitors had arrived a few months later.

Sam had been walking across the tarmac with his work crew and a cart. His shipment was arriving that afternoon and he wanted to be sure to get it before the local union goons took it for ransom. He couldn't afford to pay any more "conveyance charges" to get it shipped from the Trenton airport. That was part of the reason for his crew; burly types selected more for their intimidation factor than their skills.

Sam was nearly blown over by the sudden rush of air that accompanied the arrival of an alien shuttle craft. No sooner than had it stopped rolling than the ramp slammed down and an unbelievable assortment of aliens tumbled out, scrambling over one another in a mad rush and scattering in every direction as soon as they hit the concrete.

Sam briefly glimpsed something that looked like a skein of brightly colored wires rolling along as it spit out sparks. Something that looked like a hairy toothpaste tube slithered close by his leg. As he watched that thing wiggle away, a monstrous elephantine creature with a purple ear (or was that its trunk?) nearly stepped on him. He dodged and stumbled into a bilious green thing, shaped like nothing so much as a tree trunk that was slowly rolling down the ramp.

"Scrmbfgght!" the tree trunk exclaimed with recognizable anger. A wicked-looking tentacle waved from the top of the trunk while a reddish eye waved around on a flexible stalk. Sam jumped back in horror, hoping that he hadn't broken some alien protocol.

Behind the tree trunk were two smaller versions who were obviously straining to push it across the tarmac.

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"Fashtaaar!" the big one shouted and waved its tentacle furiously at the departing crowd. The smaller versions were obviously pushing as hard as they could, but were unable to propel the platform on which the tree trunk sat any faster.

A shout went up on the other side of the field. When Sam looked in that direction he saw a large group of distinguished citizens and even more members of the press racing madly after the rapidly dispersing alien horde. Apparently the first delegates from the galactic hegemony were intent on avoiding formal ceremonies.

Sam saw an opportunity to establish a relationship with these visitors from the stars. "Would you like some help?" he asked graciously, keeping a wary eye on the agitated tree trunk.

"Of course," the larger snapped back quickly. "Mardnnn, our father, is very anxious to begin our business on this new world." The green tree trunk garbled something else and furiously waved its tentacle in the direction of its fellow travelers.

"Pops doesn't want the others to grab all the advantage!" the smaller one added.

Sam quickly considered his options. On the one hand, these aliens were a possible threat to everything humanity held dear. On the other hand, there were probably a few bucks to be made by those who built a relationship with the aliens. "I happen to have an office you could rent," he suggested, "and I can offer my services at a very reasonable price."

"Excellent!" the alien exclaimed as it waved its tentacle over its head and its eye stalk panned Sam from head to toe. It turned to the tree trunk—Mardnnn, Sam reminded himself—and rustled some phrases.

"I am Town," the alien version introduced itself, "and this is my sister, Brill." The smallest alien waved an appendage in Sam's direction and winked its eye. "Mardnnn agrees that having a native guide working with us will be an advantage. Now, please have your children," Town waved a tentacle at Sam's work crew, "take us to your orifice."

"Office," Sam corrected.

"Whatever."

Since that fateful day Sam had worked hard for Mardnnn and his daughters, performing tasks that ranged from the deranged to the obscure—escorting aliens of every shape and size to places selected for reasons unknown. For the most part the alien visitors were fairly civilized, comporting themselves with some degree of restraint and considerable curiosity about every quaint Earth thing in sight. There were a few exceptions, he recalled with a shudder, remembering the most recent trip to Atlantic City. That was one of the things about the galactics that made him edgy—no one knew what might set them off.

Sam brought his thoughts back to the present and blotted a few gobs of green spittle from his freshly pressed shirt as he tried to decipher what Mardnnn had said. He hated to ask him to repeat his words, for the Crumptonian was exceedingly proud of his command of human speech and attributed any misunderstanding to

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Sam's obviously deficient mental abilities.

"Damned human," were obviously the first words of his boss's complaint, but what could "nodgid nythgg rid" mean?

"Pardon," he said as ingratiatingly as he could muster, "Could you repeat that?" He hoped that Mardnnn wouldn't go off on another of his tirades about the burdens of bringing "civvlizzzashunnn" to Earth.

"Vladish humans screwed up me trip!" the blue Crumptonian said grumpily.

Aha, now he understood! Mardnnn was complaining about the screw-up of his travel plans. Sam had called the travel agency a week before to book a place on a train to the alien base in Trenton, New Jersey. From there Mardnnn could be transported to one of the galactic ships in orbit. He had already reserved a place on a Poshinova liner to Erandi Prime, where the Crumptonian had important business to conduct; something about descending principles, at least that is what Sam thought he said, which didn't necessarily mean either that he interpreted it correctly or that he would understand what it meant had he done so. Such were the perils of working for one of the galactics.

One of Earth's big mysteries was why the galactics chose to establish their base in Trenton when the capitals of the world—London, Washington, Paris, Moscow, Beijing, Capetown, et al—had offered their very souls for the opportunity. Brill, Mardnnn's daughter, had confided the reason to him in an embarrassed hush that told Sam he wasn't to reveal it if he treasured his job. "We put it in Trenton," she said, "because it is so convenient to Hoboken!"

Apparently the clerks at the travel agency had failed to understand Mardnnn's simple request for transportation to Trenton; an appalling deficiency in their intelligence, according to Mardnnn, hence his statement that they had "screwed up his trip!"

Sam sighed and picked up the phone to remedy the problem. In a matter of moments he had arranged for a local trucking company to pick up Mardnnn and deposit him in Trenton with ample time to make his connections to the waiting liner. The timing of the connection was critical, since Mardnnn absolutely refused to travel in the human shuttles, which still used primitive and dangerous rockets, of all things, to reach orbit!

"Take care of this," Mardnnn pronounced in a surprisingly clear voice, as he waved an envelope wildly about in Sam's general direction.

Sam snatched the envelope from Mardnnn's tentacle the second time it came past his head. Quickly he scanned the contents. It was just like the dozen other requests he had processed over the past months for Mardnnn's clientele. Included in the envelope were the usual request for tickets to Disney World, the galactics' favorite tourist spot, along with the list of visitors, and a flyer that offered a reduced rate on groups of fifty or more. Mardnnn had already placed a thick black mark beside the rebate block.

"But you've only requested two

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tickets!" Sam protested. "We can't get a reduced rate on just two tickets!"

"Schtupid," Mardnnn sneered at Sam's lack of understanding. "These visitors are Kittchikoostrans!"

The Kittchikoostrans, as Sam recalled from a briefing he'd received earlier in the week, were aggregate persons, a single mind in multiple bodies. Apparently these two "individuals" on the manifest were actually more than just two bodies. He wondered what the visitors would look like—just how many whirling teacups would a Kittchikoostran fill? Hmm, would Disney World charge by the head count or the identity? He realized that this rebate offer might present a few complications, he thought, not to mention the opportunity to have some serious discussions of epistemological realism and the nature of identity with Disney World's management.

"There might be a slight dispute over the head count," Sam suggested, hoping that the visitors had heads! "How many bodies do these two, uh, individuals occupy?"

"Fifty—sixty?" Mardnnn replied with a puzzled spit of green goo at the end. "Not sure."

That was certainly over the rebate limit. "I'm afraid that we'll have to get tickets for every one of their bodies."

"No vladish way!!" Mardnnn exploded in an angry spray of bilious spittle. "Two Kittchikoostrans, two tickets is all!"

Sam sighed; he seemed to be doing a lot of that since he took this job. How was he going to make Mardnnn understand that the offered reduction was tied to the number of bodies who used the tickets, not just the number of individuals involved. This looked like it was shaping up to be one of the more interesting challenges facing him since he started working for the Crumptonians.

He had just opened his mouth to attempt an explanation, when the door flew open and Brill dashed in, bouncing off two walls before coming to rest in front of Mardnnn's platform. The young Crumptonian bubbled a string of incomprehensible yellow foam at her father, suffusing the office with a fine golden spray, got a frothy green response from Mardnnn, and then turned to Sam.

"How are you, friend Sam?" Brill sprouted brightly. Unlike her parent, Brill's air hole had not yet solidified sufficiently to mangle her words. That would happen eventually, Sam knew. In time the young Crumptonian would change from her mobile form to become a sensible male adult; sessile, stolid, and steady, anchored to his platform for the rest of his life.

"Not so fine," Sam replied, and quickly outlined the ticket problem to Brill. He hoped that, perhaps, she would be able to make Mardnnn understand the delicate distinctions the mouse kingdom would make.

Brill was quick to grasp the intricacies of the situation and fired off a rapid stream of hissing, spitting bubbles to her father. Sam had always been amazed at how quickly Brill could grasp Earth's peculiar way of doing things. Most of the other aliens he'd taken on tour appeared puzzled by nearly everything human—"part of the charm," a fifteen-segmented worm

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in a fuchsia environment suit had remarked casually as it purchased a ceramic urinal in a hardware store and perched it rakishly on its head with one of its antennae sticking through the drain hole. "Isn't it just *me!*" it had preened as it displayed its new acquisition to its fellow travelers.

One of the more outstanding puzzles to nearly all of the galactics was humanity's singular failure to discover the phloomb effect, which was the basis for all galactic communication. Instead, the human race had, from the galactics' point of view, wasted enormous resources on harnessing electromagnetic energy, "which couldn't even push a signal beyond light speed, for heaven's sake!" Needless to say, acquisition of a proper phloomb generator had become Earth's top priority.

"Pops says he'll never understand the way you humans think," Brill said. "But he doesn't have the time to screw around arguing about it. He wants you to make all of the arrangements while he is off to Erandi. Says to just do the best you can."

"I'll need some cash to take care of the tickets, transportation, and so forth," Sam replied and stood by as Brill relayed this request to Mardnnn.

"Pops says you can use the corporate account to pay for anything that might come up—lodging, food, transport, and so forth. He'll give you drawing rights on it. Just be sure that everything is ready when he gets back in two weeks. The Kittchikoostrans get really hissed if anything goes wrong!"

"Hissed?" Sam asked.

"Yeah, I heard that they slagged a satellite when their departure for Earth was delayed. Really infuriated the locals, but that's the kind of thing the Kittchikoostrans do when they get upset."

"What happens if they get really mad?"

Brill shuddered. Waves traveled up and down her body as she turned a deep ultramarine. "Believe me, you don't want to know," she said with fear evident in her voice.

Sam was appalled at her reaction. Given the rather callous attitude the Crumptonians exhibited toward the behavior of their erstwhile galactics, an expression of fear was significant. Did Mardnnn really want to deal with such monsters?

Mardnnn's answer was, disappointingly, absolutely, adamantly, "Yes! They got money and I got a contract!"

Sam was disappointed in this assignment for another reason. He had planned on taking a vacation during Mardnnn's absence. He needed to get to the islands, away from all of these aliens. He needed some place where he could relax with a cold beer, some good food, and an ample assortment of lovely, lovely young women. Now, thanks to Mardnnn's contract with these Kittchikoostrans, he was tied down to making these arrangements, which would probably take all of his free time!

But he couldn't refuse, couldn't say no. If he did so Mardnnn could easily dismiss him and hire one of the ten thousand other applicants for this job. Since the galacitics' arrival a year and a half earlier, soon after Earth's first starship crew had returned, everyone

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on Earth, it seemed, wanted to work for them.

Still, now that he thought about it, Orlando was a pretty nice place, if somewhat overrun by tourists. With the ability to dip into Mardnnn's corporate account he could probably enjoy a mini-vacation while making arrangements for the visitors. This might not be such a bad turn of events after all.

"Tell your father that I will do my best," Sam replied with a smile.

After they had loaded Mardnnn onto the truck Brill turned to Sam. "I need to talk to you about something, friend Sam. A bit of business, an opportunity that will make us a fortune!"

Sam was all ears. There was a lot of money to be made from this galactic invasion; everybody said so. Given the privileges of his access to the wisdom of the galactics he could easily become a rich man. "Tell me more."

"I came across a human who showed me the most amazing collection of old 'zines. They are a fabulous find, something that the galactics will just go absolutely crazy over—pre-contact stories about extraterrestrials, time travel, strange inventions, the works! For a small, no—a trivial—investment we can clean up!"

"What are 'zines?" Sam asked hoping that this wasn't another obscure alien term that he would have to twist his mind around.

Brill snorted some gold snot." 'Zines are cellulose-based sheets imprinted with deposits of colored dye depicting fanciful events—a primitive form of storytelling."

"You want to buy old science fiction magazines!" Sam exclaimed in a flash of understanding.

"Not *buy*," Brill protested with a dismissive wave of her tentacle, "invest. Yes, invest is definitely the better word. Trust me, friend Sam, the races of the Galaxy will eat these up—they *love* primitive alien literature. It's a sure thing. We can sell them for whatever price we choose. Think of what the riches will bring to you, and me, of course."

Sam had his doubts. "Well, I suppose you know better than I what the galactic market will bear. What do you need—a thousand?" That would just about tap out his funds, but if there was an assured profit it would be worth it.

Brill blushed purple and shifted her body nervously on her five elephantine legs. "Er, I'll need a bit more than that, friend Sam. Actually, I need about, er, a million; give or take a hundred thousand or so. That's in Earth dollars," she added hastily.

Now it was Sam's turn to blanch. "Urk," he said smoothly. "I don't have anywhere near that kind of money. I just barely squeeze by on the pittance your father pays me." Actually, his salary was more than a pittance by quite a large measure, but Sam wasn't about to let any of the Crumptonians know that.

Brill brightened to a brilliant sapphire. "Money's not a problem, friend Sam, you can get all you need from Pops's account. He's got lots of cash on hand." She glanced questioningly at Sam.

"Mardnnn would kill me if he

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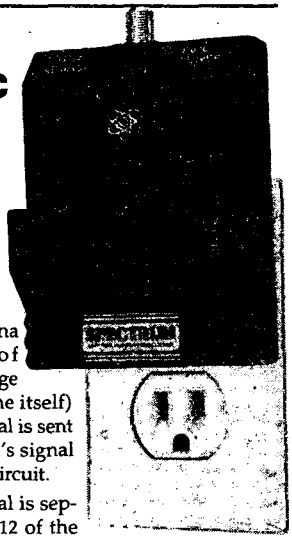

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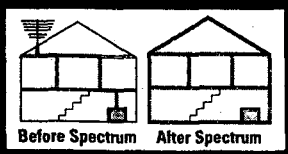

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found out that I'd used his funds for some private business. He only gave me access to the account for the Kittchikoostran arrangements. No, Brill, I just can't do it."

"Sam, this isn't a gamble—it's a sure thing! Listen, I heard that there's a buyer arriving next week. She's a real connoisseur of exotic literature and will absolutely eat this up!" Seeing the doubt on Sam's face she continued. "Look, friend Sam, we use Pops's money, get the magazines from this collector before he learns about the market potential and ups the price, then we sell the 'zines to this buyer and put the money we borrowed from Pops back into the old account before he returns from Erandi. Pops will never know the difference and we, friend Sam, will be rich!"

"Are you absolutely certain that this buyer will want them?" Sam asked, worry evident in his voice.

"Not a doubt. Stake my life on it. She's got a reputation for seizing on new markets and making her backers wealthy. Sam, she's the top gun in the cluster. Absolutely platinum-plated, gold-lined, top rate, super-guaranteed...."

"All right, all right. I get the idea. Where is this collection? When can I take a look at it? Don't want to buy a pig in a poke, y'know."

Brill was hopping up and down on her five legs, waving her tentacle wildly in the air. "Friend Sam, keep to the point: This has nothing to do with domestic slaughter and marketing of edible parts—it's 'zines we're talking about, don't you remember? But never mind; just let me take care of the details. I know what I'm doing. Just be sure that the money is going to be there when I need it. Now, we have to move quickly or somebody else will get the first foot on the platform!" With that the young Crumptonian flew out of the door and raced away to assure their future good fortune.

Sam hummed happily to himself. Now he could have a paid vacation while Brill produced a nice bit of change and still do everything Mardnnn wanted. Yes sir, things were definitely looking up.

Shortly after Brill had left, her older sister, Town, entered the office slowly, dragging her rear leg as if it had no muscle at all. Sam preferred Town to her hyperactive younger sister. Somehow her more sedate manner possessed a quiet charm that he found engaging.

"What is the problem with your leg?" Sam asked as Town settled down in front of his desk. "Did you injure yourself?"

Town laughed lightly. "Injury? Oh no, this is something more significant. You see, Sam, this is the first sign that the change is coming," Town replied.

"The change?" Sam replied, wondering what she was talking about.

"Yes. I'm afraid that I am in the early stages of what you humans would call adolescence."

Sam was quite puzzled by her remark. "I don't understand what that has to do with your leg."

Town let out a long sigh and waved her tentacle about as her eye moved up and down. "You are undoubtedly aware that we Crumptonians change

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from motile to sessile as we age. The stiffening of my leg is the first sign that I am in the process of that change. The deadening of my leg means that I have only a short while left before I have to put my foot on a permanent platform and take my place as an adult."

"So then you'll be able to vote?" Sam suggested nervously, not sure of what rights and privileges an adult Crumptonian enjoyed.

"Much more than that," replied Town with an azure dribble of spit. "I'll be allowed to breed," she said shyly, "and that is why I need *your* help."

Sam was unsure of how he could help her. Although he liked her well enough, the physical incompatibilities alone would—

"I need some of father's money," Town went on, ignoring Sam's squirming discomfiture. "One must invest wisely to secure a decent future. Don't you agree?"

Sam breathed a sigh of relief. "Oh yes. Certainly! A secure future." Mardnnn certainly wouldn't begrudge Sam giving Town a little money for something so important, he imagined. "I can write you a check for that. I guess you'll need a platform. What will that cost—a few hundred or so?"

Town hesitated. "Oh, a decent platform is cheaper than that. I can pay for that out of my allowance," she drooled and made a dismissive wave with her tentacle. "It's the rest of the expenses that I need some help on." She hesitated, turned a delicate shade of green, and then continued. "It's just that I have, that is—I want . . . oh, it is so difficult speaking of these things to an alien!" She paused for another two beats and then said, in a rush, "Oh Sam, I am in love! She is the most wonderful little swimmer that you ever did—"

Sam wiggled uncomfortably. "Love?" he squeaked. "*She?*" he said feebly, feeling as if he had suddenly ventured into waters beyond his depth, and alien waters at that. Just what sort of sex life did these Crumptonians have, anyway?

"I knew we were meant for each other when I first laid eye on her. She has the most delicious shade of pale straw, her legs are as slender as a willow, and her tentacle is more delicate than a wisp of spider web." Town stopped gushing. "Oh yes, I almost forgot; she's just under a year old—the perfect age for me!"

Sam's discomfort tuned into absolute panic. "Urk," he gurgled intelligently, trying desperately to keep up his end of the conversation. "Did you say that, uh, she's only a *year* old?" Had he understood Town correctly? Did she say that she was actually in love with an *infant*—a *female* infant at that? Most definitely he was in waters not only beyond his depth, but swarming with unknown reefs and submerged obstacles.

Town hunched down, braced herself on her back leg, and pulled her inert one over the others. "I can see that you are as old-fashioned as my father," she said petulantly, her eye stalk drooping dejectedly. "You think I am still too young, don't you?"

"No, not at all. Wait, I meant yes. No, that isn't right either. Damn it, Town, I don't understand any of this!"

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But Town obviously wasn't listening to him. "I didn't ask to come to this dreadful planet and leave all of my friends behind. No, but father insisted, said he had an obligation to show us the Universe, to make us aware of how some of the more deprived races had to live. The desolate and barely habitable Earth, he said, would be an education, something we could frighten our children with for years and years!"

"I see," said Sam, wondering how much of this viewpoint he should convey to the rest of humanity. Perhaps it would be best to say nothing. Let them find out for themselves, he decided.

"I tried to keep a good foot on it," Town continued, "but it has been hard on me. Earth was fun when I was Brill's age; always someplace to go, something new to see, to experience, some new scheme to play with. But now that I am maturing I'm starting to see things differently. You do think I am maturing, don't you, Sam?" she pleaded as she stroked the broad end of her immobile leg coquettishly and wiggled her eye stalk at him.

"Absolutely," Sam said immediately as he watched the tip of her tentacle pass back and forth along the short, blue-green elephantine limb, not wanting to offend. "Very mature, practically grown up already, if I might say so. Yes, mature is the right word." Was he babbling?

"Oh, you are such a dear," Town said, springing erect and caressing Sam's cheek with her tentacle. "Now, could you give me forty thousand from father's account to pay for the formalities? That's Earth dollars, of course."

"For this, er, female infant?" Sam inquired, repeating his earlier question. He wasn't certain of how the conversation had suddenly shifted back to money.

Town stamped her foot. "Yes, *her!* My love, the light of my life, the darling little motile that I told you about. I need to pay for the ceremony, it's my first obligation as an adult—haven't you been listening to me, Sam?"

Sam considered, going over everything that had been discussed before he answered. "Shouldn't we wait until your father gets back? I mean, he's only going to be gone for two weeks and he should certainly be there for such an, uh, auspicious occasion, shouldn't he? Oh, did I hear you right? You did say 'forty thousand' didn't you?"

Town began to wail, a bubbling, keening sound that set Sam's teeth on edge. "But she'll be too old by then! I have to do this now, right away, or at least in the next few days," she amended hastily. "Certainly before father returns. Sam, love like this doesn't happen every day. This is a once-in-a-lifetime thing, something that I might regret forever if I let it drift away. I might never find love again—think of that, Sam—I would have to go through life as an unloved, unbred, unwanted adult. Do you really want me to be a miserable, lonely—"

"All right, all right—I get the picture!" He hesitated. How many laws would he be breaking if he did what she asked? According to what he knew of this state's statutes he'd be

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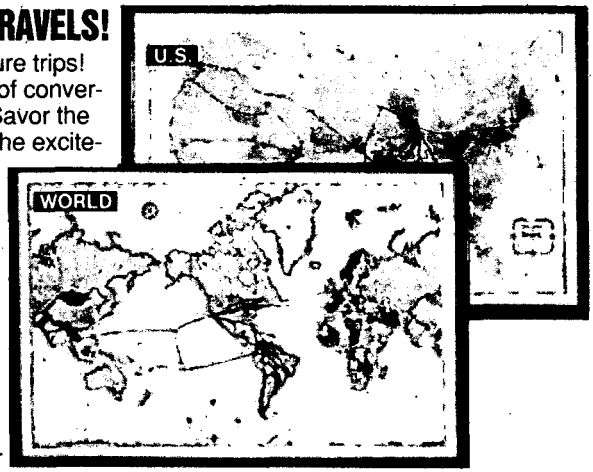

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abetting a pedophilic lesbian, which would certainly raise a few eyebrows. Wait a minute; would those laws apply to a non-human species, he wondered? Given the court's latest wave of liberal interpretations of the laws they might not even apply to humans!

"Forty thousand, you said?" he asked, hoping that repetition would somehow lessen the total needed. When Town nodded he reached for the checkbook. It was only after Town left, humming happily, that Sam considered the coincidental timing of her request with the departure of her father. That raised a disturbing possibility: Would Mardnnn really have approved if he'd still been here?

Cold beads of sweat began to form on Sam's forehead. Perhaps the better part of wisdom would be to put a stop on the check. Yes, he decided, he would definitely put a hold on the forty thousand until he thought this through. He would wait until he had thoroughly tested the waters with Town. Yes, he would have to have another talk with her. Matter of fact, the sooner the better.

He raced out of the office.

Sam couldn't locate Town anywhere. He left a message at Galactic Hall for her to contact him should she show up there for her weekly bridge club, and then started working his way through the directory of all the resident Crumptonians in the vicinity. None of them, it seemed, had seen her since the previous day.

He ran into Brill on the street and explained his predicament. "So you see," he concluded, "I simply must find her so I can explain why the check I gave her is going to bounce." And to find out more about this marriage business, he added silently to himself. "Wouldn't want to see her embarrass herself, would we, eh Brill?"

Brill shook his tentacle slowly. "I'll bet it's Schlubbb again—up to his old tricks. Pops told me how he keeps trying to work his line into our family, pushing his sprat at every opportunity, trying to adhere their grasping feet to our family platform. Why, they even approached me, of all people! Said they had just the motile for me. Can you imagine that? I mean, it borders on child abuse, wouldn't you say?"

Sam wasn't sure of what to say. About the only thing he could think of at the moment was relief that he had inadvertently prevented Town from putting a foot into something her father would definitely disapprove of. Thank heavens for small favors. He let out a sigh of relief.

"Well, friend Sam," Brill continued without pause, "I must be off. Have to finalize the deal on those 'zines, you know, and make our fortune. I'll tell Town what a fool she's being, if I see her."

"Yes, you do that," Sam replied and headed back for the office, glad that something had gone his way for a change. At least he could go to Orlando with a clear conscience.

And perhaps it would be best that he not confront Town as he had planned.

Sam was sitting in the departure lounge with a cool drink in one hand, awaiting the announcement of his

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flight to Orlando. He was very happy. Brill had made the connection, beaten the magazine collector down to just under a round million, and closed the transaction the previous day. Now it was just a matter of waiting for her buyer to arrive and depositing the funds from the sale back into Mardnnn's account. By the time he returned from Orlando there would be an enormous pile of profits just waiting for him to wallow in.

The thought of that, and the more anticipated one of sitting beside a hotel pool—soaking up the Florida sunshine, and contemplating his navel, or any exposed feminine one that might be in the vicinity—made him tingle with anticipated pleasure. The fact that Mardnnn would be paying for the time he spent in Orlando only put the gloss on his expectations. He sipped on his cocktail while admiring the slender form of a nearby blonde who was messing with her luggage. He contemplated whether she would be on his flight. That, he thought, would put a bit of icing on the old cake, so to speak. Perhaps he should offer to help her and....

At that instant his blood turned to ice water as a familiar form hove into sight. Sam shook his head, disbelieving his eyes. He looked again, staring hard to dismiss the apparition that had inexplicably appeared in the crowded terminal.

Coming directly toward him, being carried along by some sweating and straining porters, was Mardnnn, his boss! Apparently Mardnnn had not been treated well, for a froth of bubbling viridian foam encircled his air hole and gobbets of green spit dotted the porter's uniforms. "Vladish humans!" Mardnnn screamed at them. "Faster!"

Sam slumped in his seat, hoping that by doing so he could reduce the possibility that Mardnnn would notice him. Perhaps he could evade discovery long enough to ...

"Shammmmmm!!!" the elder Crumptonian shouted, suffusing the immediate area with a fine greenish mist. "I am returned."

"Obviously," Sam said to himself, as he stood to greet his boss. "You've come back rather early, Mardnnn. Is there something amiss?"

"Vladish screw-up," Mardnnn replied and proceeded to slobber and froth a tale of maltreatment and illuse. After much muddled translation Sam managed to piece together the tale of Mardnnn's peregrinations.

Apparently the Poshinova ship had decided to bypass Erandi because of a local jurisdictional dispute that had attracted the attention of the Hegemony's court clerk and therefore made proximity to Erandi a thing to be avoided at all costs. As a result, Mardnnn had been stranded at an intermediate port of call. Discovering that the port where he had been so unceremoniously deposited had an excellent and fully equipped phloomb-based ansible facility, Mardnnn had decided to use that means to transact his Erandi business. This brilliant stroke had saved him both time and money, so that here he was—he finished in an azure froth of self-congratulation—a week later, back and ready to pick up the reins once again.

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A stab of fear went through Sam as the porters began to hustle Mardnnn's platform toward the doors. What if Mardnnn checked the accounts before Brill's buyer arrived? How was he going to explain the missing funds?

In a flash he was back at Mardnnn's side. "Surely you must be tired from all of your travels," he suggested as ingratiatingly as he could muster. "Why don't you take a few days off? I can handle everything for you. Yes, you do look a bit peaked, even your color is a little off, if I must say so. Yes, I am certain, a tinge of green, I'd say, quite unbecoming. Must have been that travel does not agree with you. Are you absolutely certain that you feel up to returning to work?"

Mardnnn fumbled around, pinching a bit of his flesh and examining it with his eye stalk. He passed a tentacle across his middle region, rubbing it and pressing the tip to his mouth. "Perhaps you are right," he bubbled. "A day's rest will do me good."

"Yes, a day's rest, maybe even two days, will do you a world of good. Don't worry," Sam promised, hoping the Crumptonian wouldn't notice the sweat pouring out of his forehead. "I've got the Kittchikoostran arrangements in hand. Everything is going wonderfully well. Nothing to worry about. Everything's fine, really! Wonderful. In fact, they couldn't be better." Was he babbling too much? Had he aroused Mardnnn's suspicions?

His heart didn't stop racing until he saw Mardnnn safely onto a truck. He ensured that the destination given to the driver was Mardnnn's residence and not the office. He slipped the driver a hundred note to make certain. "No detours," he instructed her sternly.

Then he canceled his tickets and speeded for the office. He had to find Brill and set things to right.

Sam wasn't prepared for the scene in the office when he returned. Boxes were piled ceiling deep. There was just barely enough room for him to squeeze through. The musty smell of fading newsprint and aging ink permeated the atmosphere. Sam flipped open the cover of one box and examined the garishly colored magazine that was on top. A young lady, obviously nubile and mammalian, was draped loosely over the limb of a purple spider, who wore a crystal bubble over its head and sported several rather nasty-looking fangs that drooled bloody slime. The imaginary creature was brandishing a futuristic ray gun in another appendage while it stood astride a pile of smashed vehicles and ruined machinery. There were several burning buildings in the background and many humans running away, obviously in fright. In many ways the scene reminded him of the Lyconate tourists he'd escorted to Atlantic City a few weeks before, except for the ray gun, of course.

"Aren't they wonderful!" Brill exclaimed from her perch atop the pile. "These will sell like squirm bottles on the galactic market. And the best news is that there aren't any more of these in existence. This collection is all there is—the last remnant of a half-vast genre of the last century! We own the market, friend Sam. The Galaxy is our vladin!"

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TECHNOLOGY UPDATE

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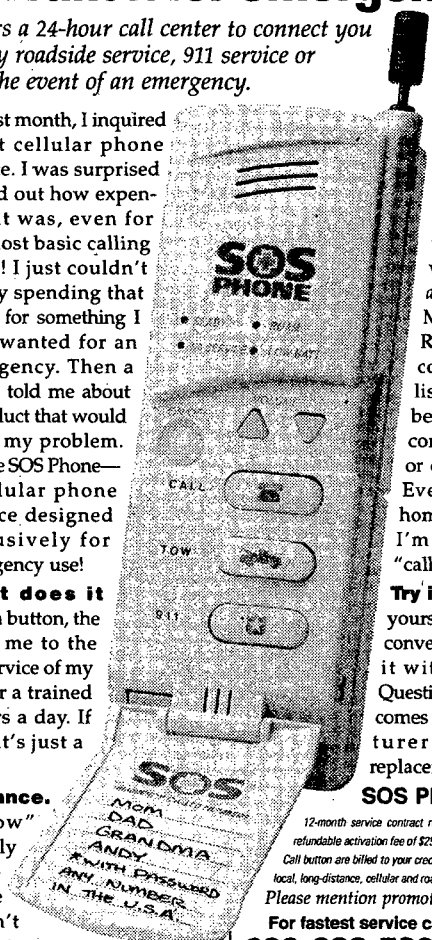

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"Why are they here?" Sam asked and wondered what a vladin might be. "I thought the buyer was going to pick these up from the collector."

Brill blushed azure. "Well, there were a few complications, friend Sam."

"Complications?" Sam repeated, with a hollow feeling in the pit of his stomach. "What sort of complications?"

"The man I bought these from said that he had some pressing family business to attend. Said we had to take delivery of them immediately as he was leaving the country. Bad bit of news, but I was sympathetic, so I agreed. I figured that, with Pops on Erandi and you in Orlando, I might as well use the office to store the goods until the buyer arrives and takes them off our hands," Brill replied. "Don't worry. They'll only be here for a few days."

"We can't wait a couple of days," Sam shouted. "You have to get these out of here right away—now, in fact."

"Why are you so upset, friend Sam?" Brill responded, dismissing Sam's obvious agitation with a wave of her tentacle. "Surely a few more days won't inconvenience anybody."

"Pops, I mean, *Mardnnn,* is back from Erandi," Sam breathed heavily as he lifted one of the boxes. "He cut his trip short. He'll be coming here tomorrow morning."

"Gack!" Brill said cleverly as she inched toward the door. "I think you have a problem, friend Sam," she shouted as she bounded down the stair and out of the building.

Sam watched the Crumptonian disappear with a sinking heart. He had not expected Brill to desert him in this situation. Now he was in deep trouble, really deep trouble. He set the box down, sat upon it, and contemplated the hideous future that surely awaited him as he frantically looked through the classified pages. How had things managed to get so screwed up, Sam wondered as he found what he was looking for and dialed a moving and storage company.

He hoped that they could handle rush jobs.

The moving company had promised that the porters would be at the office as soon as possible and that the boxes would be safely stored in the recesses of their warehouse before the day was out. Sam would have preferred that the office be vacated of boxes immediately, if not sooner, but a few hours could be endured.

A few hours later the porters had still not arrived and Sam was on the verge of calling the moving company rep for the tenth time. At the moment that he resolved to do so Brill raced into the room and caromed off three walls before settling down on top of the desk.

"Friend Sam," Brill announced breathlessly. "I've found how to get rid of the boxes. I've found a buyer!" She waved a limb at the stacks of boxes. "This Ligonian will give us fifty thousand for the lot! That will get them out of here and solve your problem."

Sam couldn't believe his ears. Had Brill really been stupid enough to sell the entire collection for a mere fifty thousand dollars? "Oh great," he moaned and lowered his head into his

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hands. "Now we only have to repay Mardnnn the balance, which should only take us a few centuries or so depending on what the prisons pay their tenants." He wondered how he would look in a Dayglo orange prison suit. Or maybe the galactics used some more fashionable color for their miscreants. Somehow he didn't relish finding out.

"Not to fear," Brill announced gleefully. "I used the money we didn't spend on the collection to buy an even better set of magazines that my 'zine collector had. It's a collection of *Improved Domicile and Habitat,* no, that wasn't it. Oh yes, it was *Better Homes and Gardens.* I just know that these are even more marketable than the other ones. By the way, he said I could send the balance that we owed to him to this bank account number in Swizzleand."

"Switzerland," Sam corrected absently as he wondered if his ancestors had been right about the paucity of intelligence in the universe. "Are you insane? That means that we are really in the red, thanks to your crafty trading."

"Are we really, friend Sam?" Brill responded, missing the sarcasm in Sam's voice. "I thought I was doing quite well. But, not to worry. We'll use the money from the first collection to pay the balance on the new collection, and even have a bit left over. Then we can sell that collection to my buyer and use the proceeds to replenish Pops's account. See how simple it all is when you think about it?"

Sam sighed. "Provided that you can make all of the sales and that the buyer has the same high opinion of these magazines that you do. Otherwise we are going to have to repay every damn cent!"

"Oh my, you are in a bit of a predicament, aren't you?" Brill responded. "What are you going to do if this doesn't work out?"

Sam rocked back on his heels. "What am I going to do? I thought that this was a partnership, Brill. Shouldn't it be, what are *we* going to do?"

"Er, not exactly, friend Sam," Brill responded as she made nervous motions with her tentacle and shuffled her feet. "You see, young Crumptonian females aren't legally responsible for their actions. With us being mobile, the adults have no way of pinning us down, so to speak. I only become liable when I settle down, like Pops. I'm afraid they'd blame the only adult involved."

Sam felt as if the hangman had just kicked the stool from under his feet. "Not legally responsible?" he croaked. "You would let them blame it all on *me!*"

"There's no need to shout, friend Sam, there's got to be a way to clear things up. I just have to work it out. Meanwhile, why don't you just go on as if nothing was the matter? I'm sure that Pops won't get suspicious if you behave normally, or whatever passes for normal with you humans."

Sam wondered where Brill's neck might be located, and how pleasant it might be to strangle the little alien.

"How could you?" screamed Town as she dragged herself into the office and threaded her way through the

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maze of boxes. "I nearly died of embarrassment when Schlubbb said my check was no good. The bank said you put a hold on the check. Why did you do this to me, Sam? Why, why, why?"

"It's for your own good," Sam replied. "After all, I was somewhat *in loco parentis,* you know. I had a responsibility to act as Mardnnn would have."

"You are just a human!" Town shot back. "How could you possibly know about love? How could you even hope to understand the depths of my emotions? Why, I'll bet you've never tasted love, have you?"

Sam pondered the question. Well, he'd thought he'd come close a time or two, but by the time he realized it, the weekend was over. But if the right woman ever came along....

"I think I will kill myself," Town announced dramatically, and threw her tentacle across her eye stalk. "I will leap out of that window and crush my body on the hard ground below." She shuffled toward the window, threading her way between two columns of cardboard boxes. "What are all of these doing here? Has father gone into the storage business?"

"No, this is something Brill thought up. But don't worry about them; some Ligonian buyer is coming by to pick them up."

"A Ligonian, you say?" Town asked curiously.

"Yeah," Sam said mournfully. "Brill sold the lot for a lousy fifty thousand and my soul, I should add."

"Brill is such a dealer, isn't she? I imagine that she'll go far. Can you help me open this window, Sam?"

"The window is sealed, so you can't open it. Besides, we're only on the second floor," Sam reminded her. "Look Town, I know this sounds harsh, but sometimes these things work out for the best."

"How could you possibly suggest that anything good could come out of this? I am desolate, unloved, unfulfilled. I shall go through life crying for my poor lost little darling. Oh cruel Earthling, how could you do this to me?"

"Don't you think you are taking this rather hard?" Sam asked. "I mean, there's still time to do things right. After all, your father will be in the office tomorrow and—."

Town suddenly stopped, her tentacle held rigidly at her side. "Father is back!" she exclaimed incredulously. "He isn't on Erandi?"

"Why, no. Matter of fact, I just saw him a short while ago. Asked him to take the day off to rest up. Isn't that good news?"

But Town didn't answer. As soon as Sam had said "rest" she had raced away faster than he had ever seen her move, with her dead leg flapping loosely behind like some sort of tail. Apparently something he'd said had upset her even more than the loss of her lover. He shrugged. Well, maybe he'd better keep his nose out of Mardnnn's family matters and concentrate on business from now on.

Speaking of which, he dialed Disney World to discuss the matter of buying tickets for the two or fifty-odd Kittchikoostrans. After the confusing sessions with Brill and Town, that should be a piece of cake!

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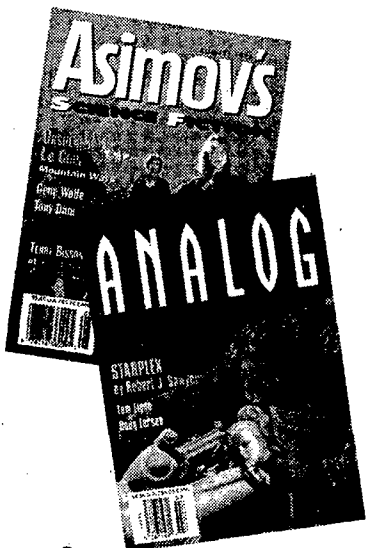

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* * *

"Nice to be back," Mardnnn remarked as Sam accompanied him into the office the next morning. They had met near the elevator. Sam tried to keep the Crumptonian from coming up, insisting that Mardnnn still looked somewhat peaked, "off-color," he had put it, and suggested that he should rest some more—another day, at least. He was hoping to buy enough time to clear the business with Brill and get the accounts back in order so that Mardnnn would be none the wiser. Apparently that was not to be, for Mardnnn had the porters carry him onto the elevator, down the hall, and into the office.

The immense pile of smelly boxes that had filled the room was gone. In its place were two small cartons emblazoned with the ubiquitous mouse logo.

For a second he wondered if Brill had a hand in this new manifestation—not that Brill had any hands, he amended hastily. Actually, he'd not heard from the young alien since she'd raced out of the office the previous afternoon.

Mardnnn slapped the top of one of the boxes. "Bring this!" he foamed at the porters, indicating his office door with a wave of a tentacle. "Shammmm—important visitor coming to look at books. Be ready!" he spat out in a splatter of bilious mist and, with a rude gesture, instructed the porters to carry him into his office.

Beads of sweat emerged on Sam's forehead. An auditor would find the borrowed funds in a wink of an eye. He was doomed!

The phone rang. It was Brill. "Friend Sam? Is that you?"

"Your father is here," Sam whispered harshly, before Brill could continue. "He told me that somebody is coming to check the accounts! I think he suspects something is amiss."

Brill was silent for a long while. Too long, Sam thought. "Hmmm, that is interesting. What are you going to do, friend Sam? Pops won't take kindly to you borrowing all of that money."

Sam was appalled at the young Crumptonian's casual assumption of Sam's culpability. "Listen Brill, we have to get our money back! Call the guy you bought those magazines from. Tell him we want it all back! Every last cent! Immediately!"

"Er, I don't think we can do that. If you will recall, the human I bought them from said something about taking a longish trip to some undisclosed location. But that's not a problem. We already have the Ligonian buyer—remember?"

Sam counted to ten, very slowly. "I doubt that we will be able to make a profit by selling the collection for a lousy fifty thousand. No, we need to get Mardnnn's money back. See if you can find someone who has the same high expectations of the buyer that you do. We—I—need to find someone willing to pay as much as you did, Brill."

"Huh, so much for all that I tried to do for you. You'd make a lousy businessman in the Galaxy, friend Sam. Well, I'll tell the Ligonian that the deal's off and hope that it won't get angry and arc on me—it really hurts, you know. The burns from those

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sparks really hurt!"

While Sam tried to puzzle out that remark, Brill continued. "I still think that we ought to wait for our original buyer and see what she has to offer. It's either that or trust that I can come up with something else. Meanwhile I'd advise you to keep Pops from finding out that the money is missing until we consummate the deal."

Sam wondered briefly if he could book passage on some outbound ship—preferably to some place where they had never heard of humans or Crumptonians. Someplace where he could breathe free and escape the consequences of Brill's stupidity. Oh, why had he ever trusted the young Crumptonian?

"See if you can find somebody to buy this stuff right now!" Sam screamed. "We need to get that money back!"

The moving company representative was quite distressed, insisting against the undeniable absence of boxes surrounding Sam, that, according to their computers, the porters had not picked up the shipment due to an unfortunate demise of the company's transport vehicle and the lack of other methods of conveyance.

Several rancorous minutes ensued, during which Sam had expressed his disbelief, demanded his boxes back, and insisted that, "I don't give a damn what your stupid computer says. My boxes are somewhere in your bloody warehouse and you'd better find them or I'll have the galactics sue you for every cent you have!" As he slammed the phone down he wondered what had possessed him to do business with such a bunch of idiots. Computers!

A few hours later Brill flew into the room at flank speed, zipped around the desk, and leaped to the arm of Sam's chair, where she balanced on three legs while flailing for balance with the others.

"Friend Sam," Brill announced breathlessly. "The Ligonian has departed, gone away without a trace or word. I can't imagine what made it leave when it almost had our collection in its fields."

"Perhaps it caught a sudden case of the smarts," Sam suggested, "and decided to skip with its purse intact."

Whatever Brill was about to say was drowned out by a bellow from the inner office.

"Shammm!" screamed Mardnnn. "Come here!"

Sam straightened his shoulders and marched into the office. Obviously Mardnnn had found him out. Well, he would face the music. He would take whatever punishment Mardnnn decided. At least he still had his dignity.

"Try this," Mardnnn instructed, whisking a small black hat with an ear protruding from either side and a thin elastic string dangling below from one of the boxes with the mouse logo, and extending it to Sam. He had another already perched on the top of his "head." The Kittchikoostrans had asked for some samples of local knick-knacks, something out of the ordinary that said, "I've been to Earth!" Mardnnn figured that, based on the fact that every alien who'd gone to Disney World, which was also every

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alien who'd come to Earth, had gone away with one of these little black hats, he'd order a gross of them for the forthcoming tour.

Reluctantly Sam put on the Mickey Mouse hat and modeled it for his boss, realizing that even dignity was easily lost. On the bright side, there was no indication that Mardnnn had noticed the missing funds.

Sam jumped when the telephone rang. For the better part of an hour he had been expecting Mardnnn to discover his theft and consign him to a life of imprisonment and poverty. Every instant that passed was an agony of anticipation, waiting for the law to come through the door to arrest him for his stupidity.

"I just found that the Ligonian left with a magazine collection," Brill screamed before Sam could even get the receiver completely to his ear. "I knew the market was hot! But that means that someone else has discovered the potential of these collections and is competing with us. That means that we'll have to move quick to get to my original buyer before someone else does!"

Sam couldn't believe his ears. "The Ligonian bought *another* collection of crappy magazines?"

"That's just what I said. Isn't this exciting, friend Sam, to be on the cutting edge of a booming market?"

The cutting edge was too appropriate a metaphor for what Sam was feeling at the moment. "Isn't there someone else who wants in on this hot market? We need to recover the funds quickly!" he croaked. "Mardnnn's auditor is sure to discover what I've done at any minute."

"Not to worry, friend Sam. Something will turn up. Then we can pay it all back with the odd change when we make our fortune. Trust me, I have a feeling for these things. This is a hot market we are in. *Hot!*"

Sam reflected that people frequently get burned rather badly around hot things. "I don't feel very well. I forgot to mention that we're in more trouble than before. It seems that the warehouse has lost the science fiction collection."

Brill shot back, "Hmm, that is a problem, but stop worrying, friend Sam. Everything is going to work out all right. As soon as the buyer gets here and sees the *Bitter Homes* collection we'll be in the money." With those final words Brill severed the connection.

Sam stared at the instrument in his hand and wondered how many times he'd have to jump out of his second-floor window to make it equivalent to jumping once out of a twenty-story building.

The gray-skinned Pequodista hesitated at the doorway. It was dressed in layer upon layer of fabrics. Cascades of chintz flowed from the creature's shoulders, ribbons of brocade reached to the floor, and swags of silk swept the floor. Surprisingly the colors and folds of the fabric gave an air of ideal composure.

"Hmmmmm, hmmh?" the Peq hummed softly. Sam was fascinated by the way the finger-like tendrils that grew from the Peq's head thrummed

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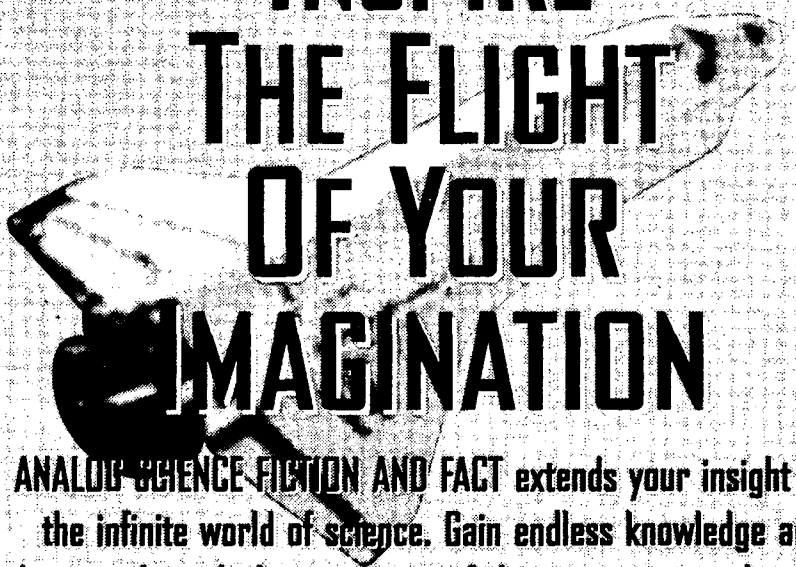

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the rose-colored bladders on each side of the alien's neck to make the humming noise.

"Hummhmmm!" the Pequodista hummed sharply while fixing Sam with a penetrating stare, much like a snake appraising its dinner.

"Can I help you?" he said as politely as he could.

The alien cocked its head to one side, removed a box from the folds of fabric at its waist, hit it hard with its fist, shook it, and looked expectedly at Sam as it repeated; "Hummmmmmmm?"

"I asked if there was anything that I can do for you?" Sam repeated.

"HmmmmH! Uhmmmh mmmh mm," the Peq mumbled, thumping the box again and again and shaking it unmercifully. Tiny sounds of broken glass and loose connectors came with each strike.

Sam was about to give up on the entire pointless conversation when a tiny speaker on the box buzzed: "I am here to speak of money."

Sam had never seen an alien using a translator before. All of Mardnnn's clients had either mastered the "primitive and simple" human languages or chose to babble with whatever communications method they normally used, snorting disgust at Sam's lack of understanding the while.

That translator would be a wonderful gadget for his work, he imagined. Why Mardnnn hadn't gotten him one was something he would have to go into later. Then Sam realized what the Pequodista had said and linked it to Mardnnn's earlier remarks. The implications of this alien arriving at this particular time struck him like a bolt of lightning: This must be the auditor Mardnnn had mentioned!

Sam's heart rate shot up until he was certain that its beating must be visible through his clothing. Think, think! he implored his sluggish brain. Right now he had to concentrate on how to get the auditor out of the way until Brill's buyer arrived.

"He's not here at the moment," Sam extemporized. "Perhaps if you went away until later, say the day after tomorrow, maybe even next week. Yes, next week is good. I'm sure that he will be back then. Absolutely certain, as a matter of fact."

"Hummmm. . . , you certain? I was told it is ready today."

"Ah, there's been a delay. Small problem, nothing to worry about, I'm sure," Sam said, propelling the alien toward the door. "Well, sorry for the mixup, but maybe we'll see you later, day after tomorrow, next week for sure. Good-bye."

The Peq seemed confused, but allowed Sam to take its arm and lead it from the office. "Hhmmmm . . . until then," its translator buzzed in parting as Sam shut the door behind it.

Sam sagged. At least that crisis had been averted. Actually, he thought that he had handled it rather well, considering. He sat down to await Brill's arrival. They had to figure out how to escape this situation else he was doomed.

"Where is she?" were Brill's first words as he dashed through the doorway a short while later. "She said that she would come right over." The

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young alien peered around.

"Who," Sam said, "are you speaking about?"

"Ahbbbb, the buyer for our magazines. She arrived earlier than expected."

A stab of suspicion gnawed at Sam's mind. "This buyer wouldn't by any chance have been a tall Pequodista?" Sam guessed. "Bit of a growth on her neck, perhaps?" he ventured. "Gray-skinned chap? Fancy dresser, by any chance?"

Brill knotted his tentacle. "Exactly. Is she in the other room? She said she was bringing the cash. She was very excited when I gave her a few details."

"Er, there's something you need to know," Sam said cautiously. "It seems that there has been something of a mix-up." Quickly he told Brill of how he had unceremoniously given the Pequodista buyer the boot. "But," he concluded, "that isn't a problem. You can just give her a call and have her pop over here and. . . ." He was alarmed at the way that Brill had turned a pale emerald. "What is the problem?"

"I don't know how to reach her," Brill admitted ashamedly. "It was only a matter of luck that I ran into her at Galactic Hall. She has lots of places to visit while she is here."

"I AM COME," boomed a loud voice from the hallway. "OPEN THE WAY FOR TRUZE."

Sam shrank back. From the volume of the great voice he could imagine the size of alien in the hallway. It had to be huge. He wondered if it could fit through the doorway. With some trepidation he opened the door.

Sam was bemused to find a tiny, weasel-like creature outside. The alien was festooned with what looked like a mass of ropes. Perhaps, he surmised, that was some sort of leash. He looked around the edge of the doorway for the pet's owner.

"I AM TRUZE," the diminutive creature announced loudly as Sam jumped back in surprise. He could not believe that such a huge sound could emerge from such tiny lungs. "DO NOT STARE," the alien continued.

"Sorry," Sam said apologetically.

"Are you here for the magazines?" Brill asked hopefully from somewhere behind Sam.

"I AM HERE FOR MARDNNN'S BOOKS," Truze said impatiently, brandishing the ropes. "TAKE ME TO HIM AT ONCE!"

Sam realized with a sinking heart that this must be the real auditor. Perhaps he could use the same ruse as he had before and divert this one as well.

"What the hell is this?" Mardnnn shouted from the inner office before Sam could offer any excuses to Truze. He'd delayed too long. With a lump the size of Texas in his throat, he waved the small alien to Mardnnn's office.

As the door closed behind them Sam knew with absolute conviction that he was dead. Only the slowness of the Universe to recognize this important fact was keeping it from the awareness of the others. Surely the heavens would open and whatever merciless gods that the galactics worshipped would strike him down. In a way, he wished that were so. Anything would be better than facing the wrath of Mardnnn when he discovered how

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depleted his accounts had become.

Sam straightened his shoulders. Best that he come clean and admit all, hopefully shifting as much of the blame as he could onto Brill's shoulders, to be sure. Perhaps he would be punished for his stupidity, but he would go with honor. He started to push open Mardnnn's door when he heard an ungodly disturbance.

The outer office quickly filled to overflowing with tiny, cat-like aliens, all of whom were dressed in skin-tight black uniforms. Sidearms and whips dangled from their identical belts. There were too many of the diminutive creatures to fit inside, so the remainder stood in the hallway, just outside the door.

"Who are you?" Sam said as politely as he could. Mardnnn hadn't mentioned the arrival of this feline gestapo.

"I am Djef," one of them announced in a sibilant voice vaguely reminiscent of a cat's purr. "I am Kittchikoostran speaker of alien tongues." The speaker waved his tail at the crowd, "And this is my mate, Dorth."

Sam examined the small furry speaker. It was quite catlike; its head barely coming as high as his waist. These Kittchikoostrans stood erect on their back legs, but their knees seemed to bend the wrong way, giving them a forward pitch when they walked. Djef, the speaker, held a staff in his right paw. Sam supposed that it was a badge of office. The staff was twice the height of the speaker and topped with a white cylinder touched here and there with spots of black, as if it had been in a fire.

"You are slightly early," Sam temporized. "About two weeks, if my schedule is right."

"Dorth and I gave the ship's crew some incentive," Djef said simply, and thumped the staff on the floor. "They were convinced to speed." Had there been a hint of menace in that response, Sam wondered? Perhaps not. These creatures didn't look that imposing. Perhaps Brill had overstated their character.

"There are only two of you?" Sam repeated as he looked over the crowd of aliens who filled the room. Behind the speaker were fifty or more similar creatures. Ah, Sam realized, about half of them, maybe more, were of a different color than the speaker. Yes, now that he looked more closely, he could see slight differences. He quickly counted heads and determined that there were thirty-two who were similar to the speaker, and twenty-two who were not. But, if there were two individuals, then where was the other speaker?

"Is there a speaker for Dorth, the other Kittchikoostran?" he asked casually. "Or is she a silent minority?" he joked.

"Hisssssssss!!" Djef and his cohort exclaimed.

Sam leaped back in fright as all of the little storm troopers drew their tiny whips in unison. Their movement was so coordinated that it looked as if they were all controlled by a single mind, which, Sam reflected, they were. He started to raise his hands over his head when the speaker lowered its staff toward him. A gout of

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flame erupted from the tip.

The sheet of flame missed Sam's head by centimeters, but only because Brill had caught Sam in a diving leap, wrapped her tentacle about him, and carried him through the doorway.

"It is not polite to point out someone's infirmities," Brill screamed as she beat him on the head with her tentacle to put out the flames while hustling him down the stairs. Every little alien within reach struck at him with their whips as he raced past them.

Sam risked a glance backwards as they descended the stairs. "Did no one teach you any manners?" she yelled in his ear.

"Nobody ridicules my crippled mate!" screamed the speaker from behind them as it shot bolts of flame in their direction.

They reached the street scant moments before the pursuing, spitting, fur balls of fury erupted onto the sidewalk. Brill shoved Sam into the back of the first cab she saw and gave instructions to the slack-jawed and staring driver. "Get out of here if you value your life! We have to get this man some medical attention." There were still a few smoldering embers on Sam's clothing.

"Why should I—?" the cabbie began and then saw the Kittchikoostrans emerge from the building. A sheet of flame licked the side window as Djef brought his staff to bear.

"Jesus, Mary, and Joseph!" the cabbie yelled and floored it, throwing Sam and Brill back hard against the seats.

As their cab raced away from the pursuing pussies Sam considered his situation. In a single week he had become the owner of two sets of magazines of no value to anyone on Earth. He had driven off the only galactic buyer to places unknown. To make matters worse an auditor was going through Mardnnn's books. It would take no time for it to discover that he had misappropriated the funds and inform his boss, with whatever consequences followed. Add to that the possibility that he had caused Mardnnn's elder daughter to do something stupid by his interference. To cap everything, he had offended an entire alien (and reportedly dangerous) race.

"See if you can find a Kevorkian," Sam suggested earnestly. "That's the only doctor who can help me now."

The nurses at the emergency ward had patched up his burns as best they could and refused his request for some potent overdose of anything they had handy. In the end they made him leave with Brill.

Sam made certain that none of the tiny Kittchikoostrans remained in the vicinity before he entered the office. A careful reconnoiter of the neighborhood revealed several traumatized dogs, but nothing resembling a cat.

The Kittchikoostrans had left marks of their visit behind every piece of furniture, an obvious sign of displeasure with their treatment. He half expected a cadre of police to be waiting to arrest him as he stepped through the door. Had they been, he would have gone quietly. It would be simple justice for the mess he had unwittingly created.

"Shammmm, glad you're back,"

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Mardnnn said when Sam popped his head into the office door.

Sam couldn't believe his ears. Was Mardnnn really glad to see him? Could it be that the auditor had failed to discover the most obvious of deficiencies in the accounts?

"What do you think?" Mardnnn announced and waved a tentacle in the general direction of Betelguese.

From the proud way the Crumptonian held himself Sam knew that some congratulatory comment was expected. But about what? He quickly examined the platform, thinking that perhaps Mardnnn had upgraded it, but it was the same dull red one as ever. Mardnnn looked no different, nor did he have any jewelry on that Sam could discern besides that obscenely orange pimple that he always wore. What could it be...?

"My library!" Mardnnn prompted and waved at the wall, his whole attitude one of anxious inquiry.

His library? What did he mean by...? Sam suddenly realized that the entire wall of Mardnnn's office was covered with knotted tendrils of some sort of rope-like things. It looked as if it were a rug woven by an arthritic elephant, so crude were the knots.

"I HAVE WOVEN AS MUCH OF HIS HISTORY AS I COULD!" Truze said from the far corner of the room. "HE CAN TRACE HIS ANCESTRY BACK AT LEAST TWENTY GENERATIONS!"

"You're not a bookkeeper," Sam said, disbelieving his ears.

"I AM A GENEALOGY EXPERT. MY SERVICES DO NOT COME CHEAP."

"Now that I can display my heritage I can arrange a suitable match for my dear Town. Now I can bargain for the best marriage we can find," Mardnnn beamed.

That raised a different concern. Mardnnn obviously knew of Town's emerging adulthood and was prepared to do something about it. Thank God he had stopped her earlier.

Sam's jaw dropped as he stared at the tendrils that graced the wall, his eyes following the lines from knot to knot. "Well Mardnnn, I must say that I am quite impressed with your," he coughed politely to hide a giggle, "roots."

Mardnnn and Truze beamed proudly as Sam quickly backed out of the office, ran down the hall, and exploded in hysterical laughter in the men's room.

Since Town had fled the office when Sam informed her of her father's early return there had not been so much as a single sighting of Mardnnn's elder daughter. Sam sincerely hoped that she had not done something dramatic, such as doing away with herself. Somehow the image of a tentacled, eye-stalked, blue-green tree trunk taking the role of Camille didn't ring true.

Not that Town was uppermost on his mind. Mardnnn's certain and imminent discovery of Sam's improper use of the account was hanging like the sword of Damocles over his head, a sword held by the thin thread of Mardnnn's trust in Sam. It was a thread that could part at any moment.

Meanwhile, Brill was desperately searching for the missing buyer that Sam had stupidly misled, as well as

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anyone else who might be willing to bid on the magazines and thereby capture a share of the "hot" export trade in Earth's exotic literature. Sam did not have much faith in the young Crumptonian's ability to safely bring them out of danger; there were simply too many obstacles to overcome.

Prison seemed a welcome possibility, free from the opportunity to screw up as he had undoubtedly done to such excess. One thing for certain, he couldn't get in any deeper than he was at present.

"A-hem."

Sam looked up, startled that someone should have come into the office without his notice. It was a sign of his preoccupation with his black future. His eyes continued to track up. And up, up, up until he reached the top of an incredibly tall alien, who resembled nothing so much as a large, multilimbed bean pod.

"Ah said, A-hem," the bean pod intoned in stentorian tones more fitting to an undertaker than a walking vegetable. Sam was fascinated by the seemingly hundreds of tiny arms projecting from the alien's sides . . . or were they roots?

"Wha . . . what can I do for you?" Sam responded while trying to figure out where the alien's voice was coming from.

"Ah have come to make some purchases," the bean pod said simply. "Ah understand that you have some," it paused as a large blossom appeared at the peak of Mount Bean pod, "dirty magazines." The blossom shriveled, wilted, and shed petals on the carpeting.

"Pardon?" Sam replied intelligently, trying to grasp the main concept of the conversation.

"You know, hard stuff," the bean thing said as it wiggled its (arms?) in a most agitated fashion. "Brill showed me one and said you had many copies you would sell to the right kind of people, if you know what Ah mean."

"Could you be talking about these gardening magazines?" Sam exploded, brandishing the single copy of *Better Homes and Gardens* that Brill had left behind.

The bean pod creature was exploding blossoms like a peach tree in heat. "Oh, you Earthlings are so shameless!" it declared and giggled. "How many copies can you sell me? Don't be shy. Ah'll take every one and never tell where Ah got them. Come now, Ah don't have all day!"

Sam fervently wished that Brill were here to handle matters. Suddenly realizing that he was the purveyor of what some vegetabilian alien considered pornography rested uneasily on his shoulders. Besides, he had no idea of where the rest of the *Better Homes and Gardens* collection might be. All he knew about were those damned science fiction pulps that the warehouse people still swore were lost.

"I don't handle that side of the business," Sam said slowly, brushing aside the shower of petals. "You'll have to take it up with my partner—the one who contacted you."

The bean pod snapped to attention, its skin smoothing to a lustrous finish as the (arms?) clenched tightly. "Ah get it. That damned Ahbbbb got to you first, didn't she? Well, Ah's not going to be overvalued this time. Ah is certain

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that my value is double hers! And mine is cash on the mulch sack!"

That cash business got his attention. Sam considered that he might do better were he to strike while the iron was hot, so to speak. "What do you think she offered?" he temporized.

"Ah will give you sixty thousand. Ah doesn't think she values them at more than that."

Sam was disappointed in the size of the offer. Such a small amount left him in a terrible hole. Apparently these stupid gardening and decorating magazines weren't even going to bring scrap prices! Why, oh why had he ever listened to Brill's stupid scheme?

The bean pod squirmed. "All right, I might value them at eighty, but not a glizzinta more!"

As Sam was wondering what a glizzinta was Town walked in. Sam noticed that she was dragging *two* of her legs behind her, and one of the remaining three didn't look terribly flexible. Apparently the adolescent change progressed rather speedily among the Crumptonians. There was another thing about her appearance that was immediately noticeable; she was wearing an orange spot, very much like her father's, only smaller.

"Where have you been, Town? I've been worried sick about you. Your sister has been looking everywhere for you."

"Please to call me Townrrr, Shammm," Town replied and flipped a tentacle toward her orange pimple. Sam noticed the difficulty she had in pronouncing his name. Apparently these changes were hardening her air hole as well.

Before Sam could say anything more, Townrrr, née Town, dragged her legs past him and the tall bean pod and entered her father's office. Sam couldn't understand the mumbled exchange between the two, but, if he was any judge of alien behavior, Mardnnn was highly upset over the changes in his daughter.

"Shammm," Mardnnn shouted, but Sam was already on his way.

"Shammm didn't give me any money," Townrrr protested before Sam could get a word out. "I sold Brill's supplies to finance the marriage."

"Sold what?" Sam asked incredulously. "You did what?"

Townrrr turned to Sam and said, very slowly, "I sold those boxes that Brill had in the office and used some of the money to pay for my marriage. When you wouldn't help me I *just had* to use whatever resources were available. Oh, I didn't tell you; I have ten thousand left over that you and Brill can have," she/he added apologetically.

Sam suddenly realized why the Ligonian had left so suddenly—he'd already gotten what he needed from Town, er, Townrrr. But, he realized, that meant that even the thirty thousand they needed for the second buyer was now beyond his reach. He doubted that the ten thousand balance from Townrrr's sale would assuage Mardnnn much when he found out an entire *million* was missing.

The door flew open and Ahbbbb, the Peq rushed in, swathes of fabric billowing behind. "HMMMMMM . . ." she began shouting as her translator stuttered out some fluttering Crump-

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tonian, a rustling that must be the bean pod's native tongue, and nearly understandable English. "Attempting to cheat me of goods. I will not hear it. I offer more than this kkkhmmmkk!" The last word was apparently untranslatable in the human language, but, from the way the bean pod reacted, it must have been a most apt insult.

"You fleem**ing Peq-head," the vegetable screamed about forty decibels above Sam's pain threshold. "You cannot have them!"

Hmmmmmh. Hmm mmmmhmm hmhmm. "Upstart satellite races that suck dirt have no use for these. Stand aside."

"You will see that Ah value these higher than you!"

"MmmmmmmmmhMMMMM . . . I doubt it, you squirmy little . . ."

"What the hell is this?" Mardnnn growled.

"These were offered to Ah first," the bean pod insisted as it leaned over the irate Peq. "They are mine!"

"You greedy little pervert," Ahbbbb hummed angrily. "You just want to get your dirty little suckers on this lode so we can't have them."

The bean pod stood upright. "And Ah supposes you want them only for their artistic value? Ha! You want to sell these to your stupid fenestraphiles, Ah guesses."

Sam momentarily wondered what a fenestraphile might be—or do? The remark obviously cut deeply, for the Peq rocked back and hummed something the translator couldn't handle. To Sam they sounded like bitter, discordant hymns.

Instead of continuing to argue with the bean pod, the Pequodista turned to Sam. "I value these precious treasures at sixty-five thousand." She turned to face the bean pod. "Adsorb that, you bower-masher!"

"I valued them at eighty-five!" the bean pod snapped back.

Ahbbbb looked disturbed by the response. "I cannot value them at that much," she hummed angrily and turned to address Sam. "You should not allow a single copy is to go to this . . . this . . . deviant, no matter how much it pays!"

"Who are you calling a deviant, you blow-faced fertilizer maker! I know what you want them for and it isn't clean dirt at all!"

"I am sure that we can settle this amicably," Sam suggested as he stepped between the two aliens. "Why don't we just take a moment to calm down and discuss this in a reasonable manner."

The telephone rang just at that moment and Townrrr answered. There was a brief exchange and then she hung up. "Someone has offered a million and a half Earth dollars for the collection."

"A million and a half dollars?" Sam couldn't believe his ears. He was saved. Good old Brill had found a buyer and pulled their proverbial coals out of the fire. He let out a sigh of relief. "I guess that closes the auction," he remarked. "Unless one of you thinks that they want to up the offer?" Fat chance of that, he thought.

"What is this auction thing?" the bean pod queried.

"You have heard how much we value these," the Peq countered. "What

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need is there to say more?"

Sam felt that he was in wonderland. "You mean to say that neither of you have ever heard about auction bidding?" When they both indicated the negative Sam proceeded to explain.

"Now, all you have to do is up the bid until one of you decides to stop. At that point the highest bidder takes the goods."

"HmmmmHhmm. A very strange process, hardly suitable for trade, I would think."

"Ah sees a compost of ideas should this catch on. You Earth types have some weird ideas, but Ah is willing to try. Ah says eighty-five thousand."

"No, no," Sam protested. "The bid is a million and a half. You must bid *more* than that—understand?"

As Sam was waiting for the answer, Brill bounced in. "When I saw that both of the buyers were here I called in the million and a half dollar offer," she whispered. "Don't worry, I disguised my voice!"

"What are we going to do when they find out they've been cheated? Did you think of that?" Sam whispered back, wondering how many centuries fraud would add to the theft sentence.

Brill went through four color changes. "I hadn't thought of that. Oh my, friend Sam. You are really in trouble now!"

Sam looked about for something large and heavy that he could use to crush Brill to a pulp. Murder wouldn't add that many more years to his sentence, he was sure. How could a poor human manage to get cross-wise with not one, not two, but five alien races in two days? He looked longingly at the window and wondered just how thick the glass was. Maybe a running leap would . . .

"Ah won't go higher than one hundred," the bean pod finally said.

"Ninety-five thousand and that is *my* final offer," the Peq hummed insistently.

"Things are going extremely well, don't you think?" Brill remarked. "I think we ought to accept that last bid." Before Sam could respond she slithered beside her father and started to say something.

Sam grabbed the young Crumptonian by a fold of her hide and hauled her backwards. "Are you insane? That bid sounds ridiculously low. We'll lose everything if we accept them. Don't you realize what a bad deal this is?"

Brill turned ultramarine. "It is? Well, friend Sam, I know that you are a better judge of these matters than I, but maybe we should let Mardnnn handle matters. It is *his* money, you know."

Sam counted to one hundred and then stopped, a glimmer of an idea in the back of his mind. Sam was puzzled; why were the two bidding such wildly different amounts? It was as if they were operating in two different number systems. Wait a minute! Maybe they were using different monetary systems. He didn't know the galactic conventions but that made some sort of sense.

"Are they making sense to you?" he asked.

"Oh yes. They are very close in value," Brill replied.

"Then I think we should continue the bidding," Sam announced, hoping

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his suspicions were correct. "But, just to keep things easily understood, let's all use Earth dollars as the medium. Is that agreeable?"

"Vladish humans, know nothing of selling," bubbled Mardnnn and busied himself stroking the orange pimple that his daughter (or was Town now a son?) sported. Sam couldn't understand why Mardnnn was so fascinated with Townrrr's color-clashing growth. As he wondered he waited for the other aliens to consider his suggestion. He prayed that his guess might be correct.

"A-hem, yes; Ah shall," the bean pod coughed, "but you must give me ample time to do the necessary conversions."

Bingo! He had guessed right. Each had been using their own medium of exchange. Now if only the Peq....

"I will extend the same courtesy," Ahbbbb hummed. "I shall convert as well."

YES!!! Sam's heart lifted at once. There was a possibility at last. "Let us begin where we left off." He turned to the bean pod. "You were bidding, I believe?"

"Seven hundred thousand," the bean pod answered with much flurrying of its digits. "Is that how this is done?"

As Sam nodded his head the Peq spoke. "HmmmmmHmm. Hmmmmmm mmmHmm hhmm. Can I say seven hundred and fifty thousand?"

"If you do I will say eight hundred thousand," the bean pod spit back.

"I have an open bid of one and a half million," Sam reminded them.

"I cannot go beyond nine hundred and seventy-five thousand," the Peq hummed angrily.

"Nor can Ah," bean pod added.

"One and a half million is the bid," Sam said again.

"Are you sure that you are doing the right thing, friend Sam?" Brill whispered hurriedly.

"Let me handle this," Sam said as he pushed Brill back. Was Brill so dense that she couldn't understand the rudiments of negotiating?

"You are not doing this the galactic way," Brill argued. "You are asking them to value the goods higher than they want to—that's bad business! Stop this now—we don't need the money."

"The hell we don't! If we can't get these two to pony up the million we can't pay back your father."

"That's not quite true, friend Sam. I have the leftover funds that Townrrr gave me. After all, they were my 'zines."

Sam choked. "Do you mean that she sold that collection of sci-fi crap for over a million dollars?"

Brill rocked back in surprise. "Of course. Didn't I mention that the Ligonian offered us fifty thousand galax credits—that's over five million earth dollars—for the collection? And after Townrrr's marriage ceremony she had two million left."

"TWO MILLION!" Sam shouted, making everyone in the room snap to attention. "No bid," he apologized, "just thinking out loud as to what I thought the collection is really worth." He did a quick calculation and realized that was more than enough to pay back Mardnnn and still have something left over. Their problems were over!

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HMMMMM. MMHM! "I cannot go anywhere near that figure. It is outrageous!" Ahbbbb sneered.

"Agree. Completely out of bounds," the bean pod snapped.

"Yes. Shut up, Shammmm," Mardnnn groused.

"So she spent three million dollars on that orange thing?" Sam whispered hurriedly to Brill. "Is it something like a wedding ring—an outward sign of commitment?" He was bemused by the discovery that these aliens were as sentimental as their human counterparts. It was rather charming, as a matter of fact. Idly, he wondered what Mrs. Townrrr and Mrs. Mardnnn wore. He'd never seen either one, come to think about it.

Brill interrupted his train of thought by laughing a film of golden spit. "Oh, friend Sam, you are so funny!" she said and slapped Sam's shoulder repeatedly with her tentacle. "That *pimple* as you call it isn't a symbol. That is *rrr*—Town's wife!" Brill sighed, "Don't you think that they make a lovely couple? And she looks a lot like mother, don't you think?"

"Urk," Sam gurgled.

"As Ah said before, eight hundred thousand dollars is all Ah can offer!" bean pod pronounced and slapped all of its arms sharply to its side. "It is a shame that Ah is denied this precious lode."

Sam was startled at the remark; he had lost track of the bidding while talking to Brill.

Hmmmmmmmmm. "I can only offer nine hundred and fifty thousand," the Peq thumped its bladders as the balky translator stuttered softly. "I not have more funds." With that she slumped forlornly. "I must let the collection go."

"Don't let them stop," Brill whispered desperately. "Tell them that we accept!"

"And let them know that we tried to cheat them with your bid?" Sam shot back. "I don't care to add fraud to my crimes."

Sam considered the two dejected aliens. Could it be that these galactics were as innocent of basic business sense as they seemed? Couldn't they see the obvious solution before them?

"Have you considered," he began with a smile and rubbing his hands together, "combining your bids and sharing the magazines between you? I assume that the two of you are interested in very different parts of the magazines. I am sure that we can allocate them amicably."

The Peq and the bean pod stood stock-still for long moments before one of them moved closer to the other. "Would you do that?" the Peq hummed. "Would you give me the parts you would not use?"

"Only if you were to do likewise," the bean pod replied.

"Excellent," Sam pronounced. "Now what would your final bid on these magazines be?"

"MMmmMHMMmm. Why, one million, seven hundred thousand and fifty Earth dollars. Did I add our two amounts right?"

"I am certain that you did," Sam smoothly assured the bean pod and the Peq. "Matter of fact, I won't even check the figures, I trust you so much. Now if you will just transfer the funds

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we can conclude this business and you can pick up your goods. Thank you—it's been a pleasure doing business with you."

Brill escorted the two to pick up their purchases while Sam breathed a sigh of relief. Now he had enough money to replenish Mardnnn's account.

"Auction bidding," Mardnnn remarked with admiration evident in his voice. "Interesting way to resolve their problem. How'd you get the idea to let them share?"

"Oh," Sam replied with a twinkle in his eye, "It was the only *ration*-al choice."

Brill sat across the table and counted out the galactic script in nice piles of twenty-four credits each as Sam looked admiringly on. "There is enough left for me to put some away enough for a decent platform," the young Crumptonian remarked as he shoved one pile across the table. "And there is a not inconsiderable amount for your trouble, friend Sam."

"I guess everything turned out rather well, didn't it?" Sam mused as he riffled the metallic notes.

Brill nodded happily. "Most assuredly. Townrrr is happily married and Pops will soon be the proud grandfather of a dozen or so sprat when Townrrr erupts. I'd say that things worked out rather well, wouldn't you?"

Sam was unsure of how he was feeling. "Erupts?" he asked absently, not sure that he had heard Brill correctly. "Well, if you mean that we managed to keep Mardnnn unaware of the condition of his accounts until after I'd replenished the account and, in the process, inadvertently solved Town's little problem with her love life, then I would say that we had."

"Not only that, friend Sam, but both Ahbbbb and Ah were very impressed at the way you led them to a solution. I think you will go far."

Later, as he headed for the office he reflected that, all in all, it wasn't a bad ending for something that started out to be such a disaster. Now if he could clear up the matter of Mardnnn's hissed-off little Kittchikoostrans he'd be completely out of trouble.

When he arrived he found Mardnnn in excellent spirits. The Crumptonian was so effusive about his daughter/son's forthcoming issue that he said not a word about the angry little pussies.

Instead Mardnnn tossed him a thick envelope. "I want you to personally escort some new arrivals to Disney World. It should be an easy job for you," he assured Sam. "No trouble at all."

Sam agreed. This way he'd get away from town and have his little vacation after all—and on Mardnnn's money as well. He began whistling as he left the office, tore the envelope open in the cab to the airport to find out who Mardnnn wanted him to accompany this time. He looked in the envelope.

There were fifty-five tickets and a note: "Djef and Dorth are anxious to meet you." ■

EDITOR'S NOTE: This story takes place before "Sam Boone's Appeal to Common Scents," (July 1996) and "Sam Boone and the Thermal Couple," (October 1995).

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Dr. Paul Levinson

LEARNING UNBOUND: ON-LINE EDUCATION AND THE MIND'S ACADEMY

Like most activities as old as humanity, the underlying structures of education seem so obvious as to be taken for granted. Formal learning requires a teacher, a student, a subject to teach, and a place to teach it—whether in the personal tutor and small academies of the ancient world or the clusters of buildings teeming with classrooms in the present day. The advent and evolution of writing, culminating in mass-produced books, changed the equation a little, bringing into play the notion of wisdom that could be at first engaged and acquired outside of the classroom. But even in education mediated by books, the nub of the process—the essence of the education—takes place in the physical classroom, the place to which students bring back the lessons they've acquired in books, for confirmation, clarification, and elaboration.

When environments are as deeply ingrained in our culture as the classroom, their limitations are difficult to see. Thus, most of us accept without much objection the fact that once the physical classroom is vacated, the active dialogue of the class is put on hold until the next class meeting. If obstacles of time and/or geography prevent us from attending a specific class, or taking a particular course, or, for that matter, attending a university that's too far away, we tend to accept that also as something that just flows from the very nature of education—

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much as we understand (though may not like) that a book we want to read may be out of the library, or that we need to stay silent when someone else is talking in a class because, of course, two people cannot talk at the same time.

But imagine a classroom equally available to anyone, anywhere in the world—or, for that matter, off—with a personal computer and connection to a phone system. Think of a classroom whose discussions, proceeding asynchronously, went on continuously, 24 hours a day, with no limitation on how many people could participate at any one time. And picture yourself with access to a library comprised of papers that could be read by thousands of people, all at once, and yet these texts would still be there for you whenever you wished.

Such conditions are not only not imaginary, they are not even near-future, in the sense of the ubiquitous TV commercial that says "you will." In fact, these are the basic structures of on-line education—a radically new mode of learning that has been quietly underway for more than a decade.

A Thumbnail History of On-line Communication and Education

The advantages of a computer as a communications tool—as distinct from a programming instrument, data manager, or word processor—were first developed in various government and corporate sites (such as Xerox's "PARC" in California) in the 1960s and '70s. In those days, people used "dumb" terminals that could do nothing other than connect to a central mainframe computer, on which people could word process, send and receive messages, and therein engage in all manner of discussion, trivial and profound.

By the early 1980s, the introduction of relatively inexpensive personal computers and modems had given this process a dramatic boost: people could now log on any time they pleased, from their homes or places of business, provided only that they had access to a telephone, which of course almost everyone did. Commercial on-line networks like CompuServe and the Source (later purchased by CompuServe) began flourishing.

In 1982 the Western Behavioral Sciences Institute began a two-year program of non-credit "executive strategy" seminars offered completely on-line to busy CEOs and government officials, at a cost of $25,000. Two years later, the New York Institute of Technology began offering a few courses for undergraduate credit on-line at a more reasonable tuition. And in the fall of 1985, Connected Education (the organization I founded and still operate with my wife, Tina Vozick) began offering a series of on-line graduate-level courses for credit granted by the New School for Social Research in New York City. By 1988, our program had developed into a full-fledged master of arts curriculum, with a specialization in technology and society—offered entirely on-line. More than 2,000 students from 40 states in the US, and 15 countries around the world including China, Japan, Singapore, Senegal, the United Arab Emirates, Colombia, and most countries in Europe have taken courses in our pro-

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gram—all without having to leave their families or means of employment.

Though modem transmission speeds have increased a hundred-fold since the mid-1980s—from 300 to 28,800 bps—and, indeed, may soon be transformed and surpassed altogether with the long-heralded arrival of "modemless" ISDN lines, the features of on-line education have remained pretty much the same since its inception. In that sense, on-line education, especially its general dependence on text rather than images, icons, and graphic interfaces, serves as a middle- or even low-tech oasis in an otherwise galloping, high-tech computer world. This, as we'll see in more detail below, allows people to participate with equipment costing hundreds rather than thousands of dollars, and is also consonant with the traditional image of the scholar in an environment somewhat removed from the hustle-and-bustle of the beaten commercial track.

Of course, advanced personal computer equipment is always "downwardly compatible" with text modes—meaning that those who have more expensive systems can take full advantage of on-line education, and indeed retrieve its written lessons via icon command, and read and write them via fancy fonts and windows, or via speech synthesizer in some cases, and interspersed with all manner of images if appropriate. In some specialized courses—say, a course on the poetics of relativity, where an equation or two might be useful—such specialized graphics might even be recommended. But even in these courses, the heart of on-line education is the text.

On the Inside of an On-line Course

The actual process of on-line education works much like e-mail, except rather than one person communicating to another or a group of people, we have many people communicating to many, with the central computer system playing the crucial role of keeping track of who in the group has read who else's messages. Here's how it works:

I teach an on-line master's level course called "Artificial Intelligence and Real Life." The course carries three graduate-level credits (in this case, awarded by the New School for Social Research), and takes place over a two-month period of time on-line. This time frame contrasts sharply with that of an equivalent "in-person" course, which at the New School would extend three-and-a-half months—almost twice as long as the on-line course. Why is this? The answer lies in the intensity of learning that takes place in a course continuously in session on-line—a course in which students can constantly log on with their thoughts, comments, and questions, and read not only what the faculty member has to say, but, in some ways even more valuable, what all the other students have to say as well.

Prior to the start of the on-line course, I prepare an "Opener" (the equivalent of a first day's lecture in an in-person class), and a course outline. The Opener not only sketches out what the course will be about, but invites students to jump in immediately with questions about the course and

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brief descriptions of who they are. In an on-line course, participation in the form of entering messages into the course is essential. Unlike the in-person class, in which the teacher can have a sense of how well the class is following the curriculum just by looking at the expressions on the faces of students, the on-line class requires actual writing by students if they are to have any on-line identity and role in the course. Thus, a highly significant subsidiary benefit in taking any on-line course is that it sharpens the student's writing ability.

My course outline, which will be posted along with my Opener on the first day of the on-line course, shows that the course will proceed very differently in each of its two months. The first month will entail students reading and discussing, with my input and guidance, basic texts in the field, including non-fiction works such as Bolter's *Turing's Man* and relevant fiction like Asimov's robot series. This part of the course will be most like an in-person course, although the dynamics of the in-person classroom and out-of-class readings will be fused together and transformed into a much more fluid, steadily progressing dialogue on-line. The second part of the course will take advantage of the on-line environment in a more unique and unprecedented way: students will play roles in a mock trial, in which a space captain is accused of murdering a beautiful female android.

In a classic *Twilight Zone* episode starring Jack Warden and Jean Marsh ("The Lonely," written by Rod Serling and first broadcast November 13, 1959), an innocent man (Warden) is found guilty of a heinous crime he didn't commit, and is sentenced to solitary life imprisonment on a barren asteroid. A captain takes pity on him, believes in his innocence, and brings a beautiful android (Marsh) along on one on his stops, to serve as company for the prisoner. The prisoner at first rejects her, then falls in love in with her. The captain returns the next year with good news: the prisoner's innocence has been established, and he can come home. But there's no room on the ship for the android, and the captain eventually has to blow her head off, leaving her wires rudely dangling, to make his point. Here the *Twilight Zone* episode ends. Our on-line trial begins several years later, back on Earth, when the freed prisoner brings the captain up on charges of murder. I play the freed prisoner, and the students play all other roles—the captain, defense and prosecuting attorneys, expert witnesses of various sorts, and the Jury. In a class of eight to ten students, this works out perfectly.

Since 1985, when I first began conducting this trial on-line, it's worked well with as few as five and as many as fifteen students. And these numbers are pretty much the limits for any successful on-line course taught by one teacher—fewer leave an on-line discussion without sufficient critical mass, greater numbers can overwhelm any instructor's capacity to respond well to each of the students.

So, on the first day of this on-line course, I post my Opener and outline. I live in New York, but that hardly matters—I have on occasion started

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and conducted courses from Bath in England and numerous cities around the US. But let's say on this occasion I "upload" my opener and outline to the central course topic at 10 A.M., EST, from New York. As soon as those messages have been entered, all registered students are admitted to the course topic. All students have access to our on-line campus and its campus-wide areas like the Connect Ed Library and the Connect Ed Cafe, but only students registered for a particular course have access to that on-line course. At 11:05 A.M. EST—actually 4:05 P.M. London time—John logs on from London, and "downloads" my message. Downloading means he has a copy of it now on his personal computer; he could also have printed it out at the time, or he may wish to print it later. He logged on using a local Internet provider he already had in England, but he could have just as easily used his CompuServe account to reach our system, or used a local public dial-up number that also connects to our system through SprintNet. Next, Laurie, an early riser out in San Francisco, logs on to our system at 11:20 A.M. EST, 8:20 A.M. Pacific time via a SprintNet node that's a local call for her, and similarly downloads my Opener and outline. But she has a few minutes, and is in a contemplative mood, so after logging off she writes (on her favorite word processor) a few paragraphs about who she is and why she's taking the course. And she also asks a question: What exactly is the difference between an android and a robot? She re-connects to our on-line campus, and uploads this text to our course topic at 8:55 A.M. her time, 11:55 A.M. New York time. Message 1 in the course is my Opener; Message 2 is my outline; Message 3 is Laurie's first note. Now Joichi logs on from Tokyo and reads these first three messages. He decides to enter a few lines about himself while still on-line, and also to answer Laurie's question. He types, "My understanding is that an android is a robot that looks like a human—either has flesh and blood, or seems to." That's Message 4. Two hours later, John logs back on from London, and enters about six paragraphs of text explaining who he is—he's a student completing his doctorate in evolutionary biology at Cambridge with a term off right now—and why he's taking our course.

I log back on now at 4:00 P.M. NY time, and am delighted to find this multi-national dialogue already under way. Five more students located in various cities in the US and Canada have yet to log on, but I can see already that the course is off to a good start. Three students have already logged on. Further, one has posed a good question, and another has answered it. Students teaching each other is one of the prime dividends of on-line education. At the end of the month, when each student submits a midterm essay to me on-line, I will make them available to all other students in our course who have submitted essays. Students thus get the benefit not only of my comments on their essays, but the comments of their colleagues. By the time our on-line trial begins in the second month, a powerful on-line learning commu-

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nity will have coalesced in our course, with students who have never met each other in person developing strong intellectual and often personal attachments—as friends, and, on occasion, even more. And these will be strengthened further in the give-and-take of our on-line trial, as the adrenaline of role-playing leads students to log on four or five times a day to grapple with such issues as what constitutes life, intelligence, intelligent life?

But for now, I give a big welcome to Laurie, Joichi, and John; express real pleasure at Laurie's question; compliment Joichi for an excellent answer; and go on to provide a little more context and background of my own—going into a little detail on Čapek's introduction of the word "robot" in *RUR*, etc. Our on-line course is well underway.

Advantages of On-line Education

Edmund Carpenter, a colleague of Marshall McLuhan, observed that "Electricity makes angels of us all—not angels in the Sunday school sense of being good or having wings, but spirit freed from flesh, capable of instant transportation anywhere."[1] The on-line student—and teacher—certainly partakes of intellect freed from the restraints of flesh, in a milieu in which obstacles of distance, time, and many other sorts are either completely eliminated or significantly reduced.

We can make a list of these obstacles, and how on-line education overcomes them:

Obstacles of geography: This is the most obvious impediment removed by on-line education. With information traveling to and from the central computer in seconds and minutes, even with slower modems, the on-line student who lives across the street from the central computer is no closer to the on-line course than the student who lives across the world. Indeed, with speed of light being the only ultimate underlying limitation on speed of on-line communication, students could easily take on-line courses from a space station, or even a Mars environment with faculty back on Earth, and vice versa.

Obstacles of time: One of the basic constraints of in-person education is not only that classes must meet at given places, but at given times. But at any particular time, either faculty or students might be ill, or plagued by subtler problems which make that time not the best for learning to take place. The problem rarely, if ever, arises in an on-line course, in which people are by and large able to log on at times of their own choosing. (The limit here would be that even an on-line course has a beginning and an end, and a time for assignments to be completed and evaluated.) The result of such choice when one participates in the on-line course means that all parties—faculty and students—tend to participate at their best, when they're likely to derive the most benefit from the experience. Further, the important thought that occurs to you after a vigorous in-person class session concludes is usually lost to that class; in contrast, in the on-line course, you can log on the next morning, or even in the middle of the night if that's

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when the thought occurs to you, and contribute it to the on-line discussion that is literally ongoing throughout the extent of the course.

Obstacles of retention: As every student knows, taking notes in an in-person class is a highly inefficient method of storing information—the act of taking the note usually renders you incapable of hearing what else is being said at that time. In contrast, everything that goes on in an on-line course is automatically and continuously available. This intellectual safety net for ideas makes for a richer, more informed, educational experience.

Obstacles of economics: This is closely related to the geography and time limitations of in-person education. For many people, the need to work for a living puts them in a place too far away to take a course; or perhaps renders them too fatigued to take a course during the evening when they are off work. On-line education overcomes both such problems—and greatly increases the number of people who can take part in what Comenius called the Great Dialogue. And this is why, to return to a point I made earlier, on-line education must be careful not to introduce economic restrictions of another kind—requiring expensive equipment to participate—which would undo its natural democratizing tendencies.

Obstacles of teacher domination: As indicated earlier, students learning from students is a basic dynamic of on-line education. This doesn't mean that on-line faculty abdicate their responsibility to teach; but it does mean that, rather than attempting to inject or spoon-feed information into passive student minds, the best on-line teacher is rather someone who attempts to elicit active student learning, in the tradition of such educational theorists as Montessori, Dewey, and Piaget.[2]

Obstacles of physical disability: In spite of recent strides made in facilitating access of physically disabled students and faculty to in-person classrooms, such access is by no means easy or comprehensive. Access ramps at urban universities provide no help in getting wheelchairs through the traffic-clogged streets that lead to the university. Further, impairments of hearing and seeing can make the in-person classroom a difficult place in which to learn, regardless of how easily one might be able to get there. The on-line class eliminates most of these impediments. One of Connect Ed's first students, in the mid-1980s, was someone who had been deaf since birth. I met him in one of my in-person undergraduate courses at Fairleigh Dickinson University, where he struggled to keep up with the proceedings by tape recording my lectures and discussions with the students, and having them transcribed for later reading. His capacity to contribute to the class via this second-hand participation was of course severely limited. But within days after he registered for his first on-line course, he was playing a leading role in on-line discussions: in an educational environment in which intellect was already freed from the flesh, his intellect was able to roam and create with the same verve as anyone else's on-line. Currently, one of our most dy-

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namic on-line teachers, Tzipporah BenAvraham, conducts her "Technology and the Disabled" course from her wheelchair. She is legally blind. But voice synthesizers convey all the words on the screen to her. Just as lack of hearing was irrelevant to my on-line student in the 1980s, so lack of vision is irrelevant to Dr. BenAvraham when she teaches on-line. Or rather: lack of external vision is irrelevant, just as lack of the outer voice was to my student. What counts on-line is the inner voice and the inner vision.

In view of the above advantages, we may wonder why on-line education hasn't taken the academic world by storm. Though many schools offer courses with some on-line adjunct, or a course or two offered entirely on-line, only a few schools—such as The New School for Social Research (New York), University of Phoenix (San Francisco), Nova University (Orlando, Florida), Polytechnic University of New York, Bath College of Higher Education (England)—offer anything approaching a full-scale on-line program. The reasons are two-fold. The first, and far less significant, has to do with some of the intrinsic limitations of on-line education. The second has to do with the resistance of the educational establishment.

Drawbacks to On-line Education: Intrinsic and Imposed

The first and foremost limitation of on-line education that must be acknowledged is that it's not a panacea: if a person, for reasons having nothing to do with geographic location, time constraints, and the like, doesn't want to take part in a graduate level course and its requirements in terms of reading and writing, then no amount of flexibility in terms of time and place of access can give this person a successful on-line experience. Further, success in on-line education—for faculty as well as students—obviously presupposes a facility, even a pleasure, in the written mode. My colleagues know me to be equally garrulous in speech and writing; but many faculty are more comfortable with the spoken than the written word, and the same is true of some students. Of course, participation in an on-line course can elicit and sharpen a student's written skills—some of our most successful students have been dyslexic—but there has to be an underlying joy in text as a mode of expression even in that case, waiting to be tapped.

And not all subjects can be taught with equal facility on-line. Certainly the liberal arts and humanities, the theoretical aspects of the sciences, and professions like the law are very well suited for the on-line curriculum. But other areas are inextricably in need of hands-on tutoring. Were I to require brain surgery—and many people in the academic world no doubt think that I do—I would prefer to be operated upon by a surgeon who was not exclusively educated in an on-line program, thank you. Of course, new imaging available on the most sophisticated on-line systems, with the resolution of video, can convey many kinesthetic facets of the surgical experience. But I would still prefer a surgeon who had been trained at least

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partially in person—certainly in terms of what is available in on-line education today.

So the intrinsic limitations to on-line education are substantial. Yet they by and large do not account for the very slow growth of this new mode, especially surprising in the areas mentioned above for which it is so well suited. No: that slow growth is more likely due to the resistance of many faculty and administrators in the academic world.

As an example, consider the views of Neil Postman, a leading professor of communication at New York University, who as recently as 1994 opined that computers in general, and on-line education in particular, were just glorified forms of television, with the same inconsequential or even actively destructive impact for literacy and education.[3] The swipe against television aside (which is unfair in its own right), Postman overlooks completely the extent to which the computer functions not like a television, but a book, and an interactive book at that. Computers undeniably do traffic in screens—and, with the advent of the Web and Windows—with all manner of colorful pictures, graphics, and icons on those screens. But the essential currency of all serious on-line communication, whether on public commercial services like CompuServe and America On-line, or in on-line courses such as Connected Education's, remains the written word, the text, and all its power for communicating highly complex and abstract ideas. When we add to this power the capacity of on-line participants to question the written words, to shape them in dialogue, we get a medium having almost nothing in common with television and its one-way communication of pictures and sounds. Socrates' yearning for an "intelligent writing"—one which responded to questions put to it, as in a dialogue, rather than preserving a "solemn silence"—is fulfilled on-line.[4]

The Human Option

The above rejoinder to unfounded criticisms and distrust of on-line education is logical; but the distrust is more deeply rooted, and flows from the plain comfort people have with the media that brought them to the positions of power that they occupy. All of us, and educators are no exception, tend to gravitate towards that which we know best.

We of course know best our in-person environments—from our family lives, the classrooms we attend as children, the people most of us work with on a daily basis. From such a vantage point, the prospect of an on-line community—of people getting to know each other on-line, learning from each other, even caring about each other—may seem far-fetched. The computer, after all, for much of its still brief tenure in our popular culture, was assigned the role of a cold, impersonal, programming instrument.

But the reality of on-line communities and on-line education is different. Students in on-line courses become good friends, visit each other in diverse cities years after their on-line courses are over. On-line education, while not satisfying every educational

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or human need, is in fact an intensely warm and humanly interactive option.

There are obviously some human things that can't be done well or at all in cyberspace—walking hand-in-hand on a windswept September beach, dining in a fine restaurant with wine and candlelight. . . .

But education, the realm of human activity that deals with the life of the mind par excellence, isn't one of them. My expectation is that we'll all find an increasing number of peaks of that kind of experience on-line in the next century. ■

Notes

1. Edmund Carpenter, *Oh, What a Blow that Phantom Gave Me!* (New York: Bantam, 1973), p. 3.

2. See Henry Perkinson, "Education and Learning from our Mistakes" in Paul Levinson, ed. *In Pursuit of Truth* (Atlantic Highlands, NJ: Humanities Press, 1982), pp. 126-153, for a thorough discussion of the student as an active learner, and the champions of this educational philosophy.

3. Neil Postman, The John Culkin Memorial Lecture given at The New School for Social Research, 16 February 1994.

4. Plato, *Phaedrus*, secs. 275-276.

Further Reading About On-line Education

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Michael F. Flynn

GIDEON

The forces that drive people into space may be quite down to Earth. . . .

Illustration by Vincent Di Fate

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Flaco had known that it would be bad, but he had no idea how bad it would be until Serafina called him by every name he had.

"José Eduardo Gonsalves y Mercado! You cannot be serious!"

Flaco leaned against the frame of the open window and stared at the snarling traffic on Fort Washington Avenue, four stories below. At the grimy sidewalks, at the tight-packed throng of people passing one another in rigid isolation. At the dealers and the hookers and the hustlers hanging on the street corner—the corner of "Powder and Pussy"—waiting for the cars from the 'burbs to come and deal. He would give anything to leave this place; to find Serafina a home somewhere bright and green, where flowers grew. The Sun was still high and the breeze that rippled the dingy white curtains of the apartment brought no relief from the July heat.

Flaco shrugged and stepped into the kitchenette of their two-room flat. He pulled a six pack of *El Presidente* from the refrigerator, snapped one can out of its ring and tossed it to Serafina. He took another one for himself and rubbed it across his forehead and the side of his face. The icy condensation on the can let him forget for the moment how hot it was in the city. Even the sleeveless undershirt he wore did not help. "It is a wonderful opportunity," he said.

"An opportunity to kill yourself!" Serafina shook her fist at Flaco. The fist holding the can. It would be a bad thing, Flaco thought, to be near that can when it finally opened. He popped his tab one-handed with his thumb, and poured half the contents down his throat. Then he put the can to his forehead again and rolled it back and forth. Serafina could not understand how important this opportunity was for them. . . .

"The company will take good care of us," he told her.

"The company cares only about the money!" she said.

"Righteous beans," he said, switching to English. It was not so grand a language as Spanish, but it did have its own peculiar charms. "They spend all that money training us," he continued in the same tongue, "they gonna take real good care of us when we're upstairs." He ought to speak English more often. It would be important when they made the final selections. They wouldn't take along anyone who couldn't talk to his crewmates.

"You're crazy, Flaco. My mother always told me never marry a Dominican. They're all crazy."

Flaco reached out and grabbed Serafina by the waist and held her tight against him. "That's why we come after you Boriqua girls. You drive us crazy."

"Flaco . . ." She pushed against his embrace, but not too hard. He was a skinny man, but wiry, with arms as strong as cable. You work as a rigger, you had to be strong. And there were worse places for Serafina to be than in her husband's arms.

"I told you all about the hazard pay and the bonus. No place to spend money in orbit, so you and me, we have a good pile when I come back. Enough maybe to buy us a nice house." Telling her about the hazard

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pay, that had been his mistake. Hazard pay meant hazard. Well, rigging was always dangerous, if you didn't know what you were doing. Be some special dangers up in space, Tucker had told him. Yeah. So, they wouldn't need people like Flaco, otherwise. "Be plenty money," he told her as he insinuated his free hand between them, rubbing it over the hard, flat surface of her belly—not yet swelling with his son. "Set little 'Memo' up in style!"

"Mmm," she said, pressing against him. "You're still crazy." But she said that while she kissed him.

His fingertips found the waist of her jeans and he pushed them inside. Serafina squeaked . . . and pulled the tab on her beer can.

The spray spattered them both with the ice-cold liquid. It drenched the white undershirt he wore. Serafina laughed and danced away and Flaco chased after her. She ran behind the sofa and they faked left and faked right, and then Flaco leaped over the back of the sofa. She whooped and dodged him.

He cornered her finally in the bedroom; but they had both known when they started that he would.

Ossa and Pelion Heavy Construction held its qualifying trials at Pegasus Field, several miles south of Phoenix, Arizona. The company shuttle bus from Sky Harbor rolled through a different country than the one Flaco knew. He had never seen so much empty space, or so few people. It gave him the shivers. A dull-colored bird burst from the roadside brush and darted across the highway in front of the bus. The driver said it was a roadrunner and one of the other men on board said, "Beep-beep!" The way the driver laughed, Flaco figured he'd heard that one already.

The Pegasus complex was a half dozen low-profile adobe-tech buildings set in an arch around a broad landing field. The airport shuttle dropped Flaco and two other men at the administration building in the center. They stood with their duffel bags in the hot, desert wind, wondering where to go next. A large bronze of a winged horse reared above the main doors directly in front of them. Through the gap between the admin building and the next one to the left, Flaco could see spaceships squatting on the field. Three of them were the small ballistic ships that flew Earth-to-Earth; but the big one with the scorch marks was an Orbiter.

Flaco stopped a man in brown coveralls who seemed to know where he was going, and asked him where the riggers who wanted to work on the space station were supposed to meet. The man gave them directions and Flaco thanked him. As they set off, one of Flaco's companions spoke.

"Do you know who that was, *'mano?*" Tonio Portales was a thickset Miami Cuban who had joined Flaco's flight in St. Louis.

"Who?"

"That dude you stopped for directions. His name tag . . . that was Ned DuBois."

Flaco shifted his duffel bag to his shoulder for an easier grip. "DuBois? Wasn't he the man who—"

"Yeah," said Tonio. "He was 'The

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Man Who.' First dude ever took one of those Plank ships into space."

Flaco grunted. "He still flying? I was just a kid back then."

"You chust ein kid now." Sepp Bauer, Flaco's other companion, had joined them at the Pegasus shuttle stop in Phoenix Sky Harbor. He had come from some place called Karlsrühe by way of JFK, and spoke an English so badly accented that Flaco could barely understand him.

"I mean that was, what, nine years ago, right? I was only thirteen. In middle school. They showed it on a big screen in assembly. Remember how they thought his co-pilot was lost in space, but DuBois found him anyway?"

They found the check-in table just inside the entrance to the second building. Flaco showed the first woman his driver's license and she gave him a name badge with his O&P company photograph already on it. The others had to look into a vidcam and have their images scanned onto cards. The "pix-pics" looked as bad as anything ever captured on film. The second woman checked his plane ticket against a computer screen and gave him a chit that he could use for reimbursement later. The third woman gave him a folder stuffed with all sorts of documents.

"There are forms in here for you to fill out," the third woman explained. "O&P employment form. Government tax forms. This . . ." she pulled one out and showed it to him, " . . . is an application for a green card. Because this phase of the construction is being managed out of Phoenix, an American work permit will be required."

Flaco grunted. *"No necesito una tarjeta verde."* His parents had brought him to the States from the Republic when he was eight, but he didn't see why he had to explain himself to anyone, least of all to a down-your-nose Chicana. Boriquas and Cubans were enough to put up with.

The woman looked doubtful, but shrugged. "Your packet also includes today's agenda, *'mano,*" she continued, "plus a map of that part of the facility you are allowed into."

"And tomorrow's agenda?" he asked.

A wintry smile, all the colder for the desert heat he had just been in. "You will be given that *if* you are invited back."

Flaco saw what she meant when he entered the auditorium where the opening meeting was to be held. It was laid out like a movie theater, with a stage and a screen up front and rows of seats on risers. There were easily two hundred men in the room. Some pasty-faced Anglos, but mostly a mixture of bronze and ebony. Young, strong, and immortal. Thin, burly, bearded, clean-shaven. A handful of women, each one the target of a dozen men. Flaco was surprised that so many men had volunteered their personal time just for the chance to be picked for one of the fifty slots.

Eh, ¿por qué no? The pay was generous, and later you could point to the sky and tell your grandchildren that you had built a star. It would be a thing to be proud of.

The men sat scattered around the

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auditorium, some chatting in groups, twisting around in their seats and leaning over the backs, or standing in the aisles, or lounging against the wall under the projection booth—chattering in a hodgepodge of languages that blended into an unintelligible buzz. Most of them sat alone, slouched in the padded seats with their arms folded, waiting for something to happen. A few were sleeping.

There was a group of ten men—mostly chunky, mostly blond and pale-eyed—who sat together and talked among themselves in a gargling language. Russians, Flaco guessed. He knew the "consortium" that was building the station included Russians—and Brazilians, Germans and Japanese, as well—and he wondered if there were some sort of quota system in place: so many welders or pipe fitters from each nationality. Flaco wouldn't mind losing his slot to a better rigger—well, not too much—but it would not be right to lose it to a lesser man just because the lesser man held the right passport.

Tonio caught up with him and, a few moments later, Sepp. The German was frowning over his packet of forms. Tonio pointed. "I see three seats," he said and started down the aisle. Flaco and Sepp followed him. *Funny,* thought Flaco, *how three men who have just met can become partners.* He wondered how many of the other chatting groups were like his own: friends who were also strangers.

The first speaker was a suit, so Flaco gave him a special sort of attention. The suits would not make the decisions that mattered (unless there really were quotas to be juggled) but the suits usually knew all about "purpose and scope." Some guys didn't care about that. As long as you did what the crew boss told you and you got paid on time, what did it matter? But a man who knew *what* he was building and *why* did a better job building it, and that might matter when they picked the crew.

The video they showed on the pixwall was beautiful, backed by lively, inspiring music and narrated by a voice underlaid with lots of authoritative bass. Flaco would have sworn the space station was the real thing, if he hadn't known the "real thing" was still unfinished. And maybe parts of the video were real. Who knew? That movie last year where the star had OD'd in the middle of filming—you could hardly tell which scenes had the live actor and which the morphed reconstructions.

The video started with a view of a Space Shuttle launch while the Voice explained how the external tanks were once jettisoned to burn up over the Indian Ocean. ". . . But Ourkind soon found a use for these enormous containers. A frugal sense of recycling, plus a dream. . . ."

Animation, Flaco decided as the camera "followed" the Shuttle all the way into orbit itself. Space launches were cheaper than they used to be, but they still wouldn't have had a "camera ship" flying side-by-side with the Shuttle, would they? Flaco held his breath when the background faded to the black of space. The pixwall was a maxscreen wraparound, so it

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was almost like wearing a virtchhat, which was almost, like, for real.

"Now, when the Shuttle is finished with the external tank, NASA drops it off in orbit for pick-up." The video showed a smiling Shuttle pilot waving through his front viewport to a crew of spacesuited figures wearing the LEO "Roaring Lion" icon.

"Our guys," the Voice continued in a folksy tone, "attach the booster rockets, just as the great Forrest Calhoun and Ned DuBois did when they salvaged the very first external tank in 2007—after a programming error accidentally put it into orbit."

Flaco flexed his hands and studied the action intently. Animation or actual film, *that* was a rigging job. He nudged Tonio with his elbow and jerked his head at the screen. Tonio grinned and nodded. Yeah, they teach us the proper method, you bet, but it couldn't be too hard if a couple of amateurs had done it first.

"LEO brings these tanks up to the construction site at orbit 250-E, where they are now being configured into a new space station. . . ." Now Flaco was certain the video was morphed. He watched men stringing cables and nudging the huge tanks into line, head-to-tail to form the hub shaft, fitting the others in pairs around it to form the pinwheel, ready now for the welders, pipe fitters, and other trades. Construction wasn't anywhere near that stage yet. ". . . Each tank provides over two-and-a-half kilosteres of living space. That's ninety *thousand* cubic feet. Enough cubic for a hundred people to live and work comfortably. More, if they're friendly."

People living in cast-off containers sounded a lot like a shantytown to Flaco, and some of the newsnets were calling it just that. But none of those newsers were hiring riggers, and something cheap-but-real beat a deluxe daydream any day.

When the rah-rah and the flag-waving were done—and they really did wave flags: full of stars, stripes, double-headed eagles, and all sorts of stuff to celebrate the international nature of the job—the suits handed things over to the hard hats, who gave a series of briefings a whole lot more practical and a whole lot less inspiring. The morgue shot of the Brazilian welder whose hardsuit had ruptured sent a dozen of the men out of the auditorium. One of the external tank modules would be named Anselmo Takeuchi in his honor, they announced. Cold comfort to his family, but a grander monument than most construction workers ever got. Flaco hoped they wouldn't have to name all twelve tanks, but figured there'd be more than one placard welded in place before completion.

A good thing indeed that Serafina was not here. . . .

One of the men they introduced was Morris Tucker, who would boss one of the rigging crews. Tucker stood and nodded to the assembly, but didn't speak; but then he never had been a man of words. Flaco had worked with Tucker on a couple of O&P jobs. He figured "Meat" would be a tough boss, but fair; and hoped he would draw the man's crew after he was picked.

* * *

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After the introductions, O&P marched them through a battery of medical and psychological examinations. Flaco's original application had included a complete physical exam, but LEO was taking nothing for granted. Doctors and nurses in white coats poked him and prodded him and extracted fluids by a variety of means, and they looked into places that he wouldn't even let Serafina look.

In one room they put him in a virtch helmet and all of a sudden he was standing on a girder a long ways up in the air. He had to "walk" to the other end. When he glanced "down," people and cars were so small they looked like pepper on a table cloth. When they told him to walk back again, the ground was so far down that airplanes flew below him.

He hated the pencil and paper tests most of all. A lot of the questions didn't make any sense. *Which would you rather be: a ballet dancer or a hockey player?* What did that have to do with rigging a job? Ballet dancers were all swish, but hockey players were dumber than a stone. So, which was the right answer for getting the job? I'd rather be dumb, or swish? Psycho-testing. See if you're a psycho. He wondered if the tests were really any good.

"They don't want the best welders," a burly, copper-skinned man told him while they both waited on a cold, wooden bench to be called into still another examining room. "They want the toughest welders."

"No importa," Flaco told him. "I'm a rigger."

The other man laughed. "Riggers, too," he said. "You can be the goddamnedest rigger on the face of the Earth. But you won't be on the face of the Earth. They'd rather have a second rater who doesn't get seasick than a top-notch guy who pukes in his spacesuit. Hope you're not scared of heights!" He laughed again. "They'd rather have a guy who can think cool when it hits the fan than one who follows the practice to the letter—and then cites the paragraph number that proves he did everything right, after everything turned out wrong."

Flaco grunted. "Sounds like they want me, then."

The man chuckled and stuck out his hand. "Henry Littlebear, upstate New York."

"Eddie Mercado, Washington Heights, Manhattan. Folks call me 'Flaco' 'cause I'm skinny." They shook hands. Littlebear was bigger than any man he'd care to argue with, and nearly bigger than any two. "What brought you here?"

"Same thing as most, I expect. Pay. Adventure. The chance to drop a gob of spit a real long ways. I hope you don't enjoy the weed too much, Flaco."

It wasn't anyone's business what he ate, drank, or smoked, so he made no comment. Littlebear tilted his hand up to his mouth, with his thumb mimicking a spout. "And you better not love the firewater too much. See, my wife, she's a med tech, so I know what some of these tests they're running are for. 'Weeding out the weed,' so to speak."

Flaco scowled at him. "What are you talking about, *tonto?*"

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Littlebear grunted. "Unh! *Keemo sabe*. They no want-um potheads or alkies." Then, dropping the act. "Or folks with vacuum cleaners for noses."

Now Flaco grunted. He hadn't meant *tonto* in that way, but explaining would not have improved things, and Littlebear seemed to have taken it good-naturedly. Flaco was silent for a moment. Made sense, what Littlebear said. It would cost O&P a bundle to lift a man to orbit and keep him there. They wouldn't want drugs or alcohol to screw up his judgment. "Your wife ever tell you how long afterwards they can tell? I mean, if it was just a little bit?"

Littlebear grinned. "Nerve-wracking, ain't it?" He leaned against the plaster wall behind the bench and rubbed his hands together. "Wish I had me a drink to get me through this."

Flaco gave him a suspicious look, but the man was just grinning.

At five o'clock, the shuttle buses lined up in front of the building to take them to the hotels Pegasus had booked. Flaco stood in line with the rest and waited his turn to board. His hand stole to his breast pocket once or twice and patted the folded-up receipt that nestled there. Good for one more day, so either he had passed the tests or it took time to get all the results back. Not all the men in line wore the same grin he had. Some looked dejected; some, relieved. A few had an uncertain look, as if wondering what they had gotten themselves into.

A group of Pegasus employees had gathered in front of the administration building to watch. Civilian dress for the most part, though a handful were wearing colored coveralls. The pilot, DuBois, lounged against the cement column at the foot of the building's entrance ramp, talking to a younger man with red coveralls and punk hair. Morris Tucker joined them and traded fives with the slacker. Noticing Flaco at the bus stop, Tucker waved. "Hey, Flaco!"

Flaco returned the greeting, and the man in line behind him said, "Looks like you got yourself some grease."

Flaco shrugged. "Seen Tucker around. It don' mean nothing, 'cause he don' make the pick."

"Yeah, well, having friends never hurts. Be a shame if someone got a slot outta special favors."

Flaco turned and looked the man in the eye. "You know, *'mano*, is a good thing you are already so ugly."

The other man was heavyset and wore a big, curly beard. Intricate tattoos of eagles and hawks twisted up both his arms. His eyes narrowed, and he twined his fingers through his beard. "How come?"

"'Cause then when I rearrange your face, it won' make much difference."

A couple of the men in line laughed. Sepp Bauer slipped back in line a few spaces and stood next to Flaco with his arms folded. The bearded man grunted and his lips broke into a grin. "Well, Pancho, like the poet says, 'A man's reach should exceed his grasp.'" He offered his hand. "Name's Bird. Bird Winfrey."

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Flaco almost asked if the bird in question was a buzzard, but there was no point in pushing things any further. Besides, they were about to board the bus and it would be a long ride into town. "Flaco," he said. "I'm a rigger. What's your game?"

"NDT technician. You guys put it all together; then I find all your screw-ups and make you do it over."

"Not me, '*mano*. You go talk to the welders, like Sepp here, or 'Tiny' Littlebear."

"Takes all kinds," the man agreed, now all amiability. "Takes all kinds."

Flaco had never expected Ossa and Pelion to put up them at a Hyatt, so he was not surprised when the bus turned down Van Buren Street instead, and drove between rows of broken, flickering neon signs advertising hourly rates. Some of the men—the foreigners, mostly—muttered comments about saving money at their expense; but Flaco lived in Washington Heights, so this part of Phoenix actually looked a little upscale to him. Still, nothing prepared him for The New Kon Tiki. With its facade of bamboo and rattan and the tiki masks flanking the doorways, it was about as unlikely a sight to find in the southwestern desert as he could imagine. Still, it had a bar; so, after dumping his gear in his room, he headed there.

The Aku-Aku Room was dark, with spotlights flashing off a faceted globe in the ceiling. In the back corner, a fountain dribbled into a pool in front of a plaster Easter Island statue and a pixwall of swaying palm trees and waves breaking on a lazy beach. The color was a little dull and some of the pixels had gone dark, so the effect was like looking through a dirty window. Booths separated by wicker partitions lined the left wall and a bar with tall, bamboo-and-canvas stools stood on the right. The floor space between was packed with tables, just barely enough room between them for a skinny man like Flaco to squeeze through.

The waitresses wore grass skirts, halter tops and sandals, and did the hula when they walked through the room. Navel maneuvers. The barman wore a grass skirt, too, but he was big enough that it didn't look like anyone was going to mention it. The decor was all Pacific Islands, except the CD-juke, which was wailing *a capella* "goofball" music with a Mexican beat.

A half-dozen women in spike heels and heavy makeup were making the rounds, wearing skirts so short it was hard to see why they'd bothered. They cruised from table to table, chatting up the guys, touching them, sometimes letting themselves be touched. Bird had cornered one by the waterfall and negotiations were in process. A blond with short-cropped hair draped one arm around the shoulders of one of the Russians and leaned over the table so the man's companions could get a good look at her wares.

"Like flies around honey," said one of the grass-skirted waitresses near Flaco. She held a tray of drinks balanced on her hand. Flaco stepped out of her way.

"Which is which?" he asked.

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She looked at him and brushed a dark curl off her forehead with her free hand. She hadn't spoken to him in particular. She had just voiced her thoughts. "Could work it either way, I guess." She jerked her head at the prostitute leaving with Bird Winfrey. "Never seen so many in here. Word musta got around that you guys were coming." She moved off with the drink tray, her grass skirt rustling as she rolled her hips.

Flaco didn't know if the disapproval he had heard in her voice was for the immorality or the competition. The waitress was plain-featured, with black shoulder-length hair and a face that had put on a lot of miles in a very few years; but who knew? She might be selling more than drinks, herself; and, as for quality, in that line of work the customers seldom dickered past price and delivery.

The bar was beginning to fill up with construction workers, so Flaco searched for a seat. He saw Henry Littlebear sitting on a bar stool that didn't look strong enough to support one of his legs. He was hitting on one of the waitresses. Littlebear had a schooner in front of him and he raised it to Flaco in salute as he passed.

Flaco found Tonio and a woman holding down a booth near the back and slid in across from them. "*¡Hola!* How'd you beat me down here? All I did was go in my room and toss my bag on the bed. Here you have a beer already."

"There you go, you dumb Dominican. Wasting time on nonessentials." He kicked his duffel bag, which was sitting under the table. "The room isn't going anywhere. I came here first. This here's Lucia." Tonio wiggled a thumb at the woman with him. Dusky, with a white, uneven smile; a blouse so tight and cut so low that if she hiccuped she would pop out onto the table.

"I'm Eddie," he said.

"Hi, Eddie," she answered in a throaty, professional voice. "I have a friend, if you want. . . ."

"I'm married," Flaco said. The woman gave him a look that went, like, "so what?" But Flaco didn't feel like explaining himself to a stranger.

"Just more for the rest of us," Tonio said, squeezing Lucia on the thigh. The woman laughed and wriggled provocatively, but her smile stopped at the eyes, which were devoid of anything but patience. Flaco looked away. Years ago, when he and Chino and Diego had decided it was time for them to be men, they had gone to one of the women on St. Nicholas. He had seen that look then, in the back of Chino's old Pontiac, and vowed that he would never again be with a woman who was not with him.

The waitress who served them was the same one who had spoken to him earlier. Flaco figured the odds were against the Aku-Aku room carrying *El Presidente*, so he settled for *Tecate*. The waitress took his order and Tonio's reorder, but pointedly ignored Tonio's companion. If either Tonio or Lucia noticed, they didn't care.

Sepp found them an hour and several drinks later. Tonio was in the middle of a long and improbable tale of immy smuggling in south Florida. If

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half what Tonio said was true, there wasn't a Haitian left anywhere on Hispaniola. Thanks to him, they were all in Miami or New York. Lucia pretended to listen and looked at her watch from time to time. When you worked piece rate, you didn't have a lot of time to spare for social chit chat. Sepp was a sudden blond presence by their booth.

"Dare you are!" he said, as if they had been hiding from him. Flaco slid over to make room and Sepp squeezed in beside him. Sepp looked around the lounge and put two fingers in his mouth and whistled. He made a bottle of his fist and poked his thumb at the table in front of him. Then he settled into the seat and grinned. "Now ve see vat disguises for beer in deese place." His gaze cruised over Lucia, moored on her breasts. "Hellow, schatz," he said, using the same smile.

Lucia batted her eyes. "Hello, Dutch." She moistened her lipstick with her tongue and shifted her posture to display herself better. Tonio scowled and pushed her.

"You're with me," he said.

She shrugged him off. "Whenever you're ready, *hermano.*"

Tonio lifted his schooner. "*Momento.* I'm drinking with my *compadres.*"

"What took you so long?" Flaco asked Sepp as the waitress dropped a bottle of Budweiser on the table without even pausing to see if that was what he wanted. Sepp twisted the cap off the bottle and took a swallow. He put the bottle down again with a shake of his head.

"In Bavaria, it vould be illegal to label diss 'beer.'" He threw one arm across the back of the padded bench where they sat. "It did not take zo long. I unpack, hang my clothes in proper order, arrange the drawers, stow my traffling pack. . . ."

Flaco and Tonio looked at each other and laughed. Sepp listened to them for a moment, then shrugged. "On de space station zuch neatness vill matter."

Flaco stopped laughing.

Who knew when the testing really stopped?

Flaco could not sleep. During the night, it was said, the Arizona desert grew bitter cold; but here in Phoenix the empty night sky served only to release the heat pent up in the concrete and asphalt, so that the sweltering warmth that surrounded him seemed to ooze from the ground rather than from the scorching sky. The air conditioning at the New Kon Tiki labored in vain.

He sat up in bed and stared at the glowing digital display of his travel alarm. Two o'clock? He would be in fine shape for tomorrow's—today's—competition! He did not have to be better than everyone to win a slot on this crew, but he did have to be better than a great many someones. He sighed and laid his head down on his pillow.

Only to be snatched upright by a metallic crash outside his window, followed by a shouted curse. Flaco rolled out of bed and strode to the window, where he stood to the side and lifted a gentle edge of the curtain. That was a move that Diego never had learned. When there are noises in the

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night, you do not go and stand directly in front of a window.

Funny. He hadn't thought of Diego—or Chino and the others—in a great many years. Some things were best not thought of. The nighttime streets. The women and the product and the thick blocks of cash that bought both. The trembling eager high that was half adrenaline, half product. The sound of a lone car racing by, the sight of a dark alley mouth, the distant, toy pop-pop sound of a deal gone bad. The wary, *live* feeling on the edge.

In the alleyway three stories below, he saw the shape of a woman slowly rise to her feet beside the hotel kitchen loading dock. The streetlights at the end of the block created knives of light and shadow from the angles of the buildings; and the woman, partly in and partly out of the shadows, seemed unreal. A ghost of pale, disconnected legs and arms.

She brushed herself—futilely, considering the kitchen waste and the pools of fetid water that spattered the pavement. She whipped an arm up in a gesture of contempt, but whether at a particular person or window, or just at the building itself, Flaco could not tell. She turned on her heel—and nearly tumbled to her hands and knees again. She bent and held both hands against her thigh.

Flaco wondered if he should call someone, or go down to her. Her long thighs seemed to run up forever, ducking only at the last minute behind the cover of her meager skirt. Watching her, he felt his desire swell. In this heat, skimpy dress only made sense, and he could not tell in this light or from this angle if the woman was one of the waitresses, one of the hookers, or even an ordinary citizen out walking in nighttime alleys for reasons of her own. Undoubtedly one of the women who had gone off with Bird or the Russians or the others, and who had found things a little rougher than expected. Reluctantly, he watched her limp out of sight before letting the curtain fall and slipping back into his own bed. He thought of the woman's thigh as he lay there and how it had seemed to glow from the distant streetlight.

On the third day, Flaco and the other riggers were taken to Pegasus Hangar Number Two for their practicals. The hangar, twenty stories tall, loomed over the rest of the complex just off the far right end of the horseshoe. Massive, square, and metallic, it was the only structure on the grounds that made no concession to adobe or the southwest.

The orbital ship that Flaco had noticed on Monday had been brought inside. The ship's dingy, scorched-gray fuselage had been partly disassembled. One panel still in place near the nose bore the large block numbers "RS64" and the name *Harriet Qumby*. The orbiter—they were called Planks for some reason—was two hundred feet tall, with a shell made largely of titanium-sheathed smoke. "Solid smoke" was light—"structural aerogel," they called it—but it could be difficult to handle because of its very lightness. The size of smoked structural pieces could fool you into

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thinking they were heavier than they were, and you wound up moving them a little too fast and a little too hard. Not that that would damage the smoke. By volume, it was mostly air, but it was strong, like honeycomb, and could withstand extreme loads and stresses. But it would sure as hell damage anyone in the way of it. Flaco had handled the material occasionally in construction work. The Wilson Tower in St. Louis had smoked its upper stories to gain height without putting too much weight on the load-bearing beams.

A crew of men and women in grease-stained red coveralls stood by and watched the riggers. "You dudes are crazy," one of the Pegasus mechanics shouted. "Me, I'm keeping both my feet on the dirt."

"Never said I wasn't crazy," Flaco told him. The man laughed and shook his head.

Three other men, olive-skinned with trim mustaches, stood a little apart from the mechanics, drinking thick coffee out of Styrofoam cups and talking to one another. The Pegasus people seemed to ignore them. These men wore brown coveralls, and their shoulder patches bore a winged sun rather than a winged stallion.

A third group, dressed in O&P blue with two stacked triangles on their badges, watched from a walkway a hundred feet overhead. Flaco recognized Meat Tucker, and figured the men with him were the other rigging crew bosses and their superintendent. Flaco rubbed the palms of his hands against his own denim coveralls and hitched his tool belt and harness a little higher. He'd had people watch him work before, but never so many and never with so much depending on it.

"Wonder how many of us will be left after today," Tonio whispered to him. "Figure they want to cut as many as they can before spending money on weightless and orbital training."

"Don't forget to cup the water in your hand," Flaco advised him.

"What?"

"Judge Gideon, in the bible," he said absently while he scanned the setup. "He tested thirty thousand volunteers and picked three hundred of them." Tonio grunted, but made no reply.

Two overhead cranes on traverse beams with blocks and tackle dangling from them. No, three, and the third one *way* up there was a pivot crane with an operator's booth. Did O&P expect them to be operatives as well as riggers? Probably. LEO would never lift featherbed. There'd be multi-tasking, for sure, on this contract.

A fiftyish man wearing a white hard hat and a long dust-coat was waiting for them. He had a cliputer tucked under one arm. "Gentlemen," he said (and inevitably some wit in the back of the group said, "Who came in?" White Hat ignored the comment). "I am your examiner. I have your work orders right here." He flourished the cliputer. "The O&P crew chiefs up there on the balcony will observe and judge your work and will advise me, but I will have the final downcheck. There are no appeals from my decision." He turned and pointed toward the partly disassembled Plank with

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the cliputer. "Your assignments are to prepare this equipment for its regularly scheduled preventive maintenance check. The Pegasus crew is on hand to assist you in tasks outside the rigging craft boundaries."

Flaco pursed his lips in a silent whistle. Van Huyten Industries was famous for its never-waste-a-mission frugality, so why not use the practicals to get some real work done? But that meant there was more riding on this test than just his own performance. The *Harriet Quimby*'s performance on its next flight could also depend on him. He wondered if that extra pressure was deliberate. LEO's multinational investment was in the billions and the consortium meant to regain those expenses. There would be conflicting priorities for flawless work *and* for cutting costs and maintaining the schedule—with the workers caught in between, as usual. So, this trial might be more than to test their rigging skills. It might be to see how they would react to stress.

They tested in groups of five, with the others escorted to the maintenance conference room to wait. Those who went out did not come back, and Flaco pondered that thought while he waited.

Flaco went out with the fourth group late in the morning. The examiner printed a work order from his cliputer and gave it to Flaco, and Flaco read it carefully. His task was to remove module 477JJK(3) from the forward superstructure and move it to the electrical bay. The CAD print that came with the work order highlighted the module and showed the anchors where he could hook on with the overhead tackle. It didn't look like a hard job; not one that would separate the real men from the wannabes.

He had taken two steps toward the crane elevator when he noticed the date on the drawing. Revision D. December 20, 2005. Three and a half years old. . . . He glanced at the *Harriet Quimby*. Could be the gal was that old. He didn't know one model from another, and Planks of one sort or another had been lifting for nine years, now. But who was to say that there hadn't been retrofits? Flaco turned and faced the examiner.

"Hey, *'mano,*" he called waving the print. "This the current rev?"

White Hat looked up from his cliputer and, without a change of expression, held out his hand. Flaco gave him the drawing and he looked at the drawing control block, then checked something in his database. "No," he said, wadding the print into a ball. "*Quimby*'s to Rev F." He touched a button on his cliputer and a new drawing emerged, which he handed to Flaco.

Three other men in Flaco's test group looked at their drawings, and two said, "Shit," and brought their sheets back to the examiner, too. That was when Flaco knew this would be a different sort of test, and that he could take nothing for granted.

Harriet Quimby was tall enough that the five examinees could work independently at different tasks. Three of them, including Flaco, were on the upper levels. The other two, including the sole woman among the rigger-candidates, drew ground-level assignments.

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Flaco and the two other men entered the bright orange elevator cage. Flaco pulled the gate shut and latched it, and a short, black man engaged the lift motors. As the cage rose, the short man stuck his hand out to Flaco.

"Thanks, dude," he said. "Never thought they'd give us bad prints for a test. Name's King Boudreaux, from Nawlins." He shook Flaco's hand like a pump handle.

"Eddie Mercado, Washington Heights. People call me Flaco." He studied the young man. Light tan. Only five-four, but with the shoulders of a weight lifter. Flaco lifted an eyebrow. "King?"

"Pa thought 'Martin' was a sissy name, and Ma was a Methodist and didn't care for 'Luther.'" He shook his head. "Thanks again. About the rev, I mean."

After King got off on 3-Level, the third man, who had remained silent, spoke. "Yer barmy, mate," he said. He possessed a fine, curly red beard, a respectable beer belly, and the shiniest head Flaco had ever seen. "If you'd kept yer fool yap shut, we'd have two less competitors to worry about now."

Flaco shrugged. "What if you'd had an obsolete drawing, too?"

The bearded man snorted. "Think I'm stupid? I checked mine, just like you did. Here's your stop, mate." He pulled the cage door open. "See you 'round."

"Yeah. You, too? . . ." He let the sentence lift into a question.

"Red Hawkins. New South Wales." Hawkins's handshake was a single, hard squeeze.

A Pegasus electrician and a pipe fitter were waiting for Flaco when he crossed the catwalk from the crane tower to the ship. The pipe fitter shook his hand and said, "Good luck." They had their own drawings—wiring schematics and piping drawings, respectively—and the first thing Flaco did was check his drawings against theirs. Subassembly numbers and rev levels matched. "OK," Flaco said. "Let's find this sucker." The two Pegasus mechanics knew where the module was located, but they were following his lead. They would not permit him to screw up the maintenance, though. Test or no test, the ship was signed over to their care.

But Flaco also knew that if they did intervene, he would have failed the test.

"Goddamn!" The voice came from floor level and the pipe fitter smiled.

"Guess someone down there just matched his mechanicals against the P-and-W's."

"You talk too much, Bob," the electrician said.

"Ah, no harm done, Bob. Eddie here already got past that one." Flaco looked at them.

"You both named Bob?"

Bob-the-pipe-fitter grinned. "Life's a bitch, ain't it?"

Flaco located a module that looked like 477JJK(3). The drawing said the module ought to have an asset tag, but when Flaco finally located it—in a different position than the drawing had indicated—the asset number failed to match. He looked at Bob-the-pipe-fitter.

"This puppy have a mate?"

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"Could be," the pipe fitter allowed.

"Now, who's being cute," said Bob-the-electrician. "Port side," he told Flaco. "These are regulator valves for the oxidizer tanks. Each tank got a main and a spare. Sometimes they get switched. Like you rotate your tires."

Flaco dusted his hands off and rose to his feet. "Let's go find it."

"Who cares?" said Pipe fitter Bob. "They both look the same, and they both gotta come out for PM. What difference does it make which comes out first?"

What difference, indeed? Yet, Flaco could not shake the feeling that he was still being tested. *The devil did tempt me, and I did eat. . . .*

"Get behind me, Satan," he said. But he said it with a grin to take any sting out.

"Hunh, fussy, are we?"

"No," said Flaco, "but I am thinking that the last thing you ever want to do in space construction is disconnect the wrong module."

The actual rigging was straightforward. A third man waiting for them on the port side was introduced as the regular rigger on that job. Flaco asked him if his name was Bob, too, and he winced. "Jesus, no. Call me Jimmy, eh?"

The two Bobs disconnected the piping and electricity and signed off on Flaco's work order; then Flaco unbolted the module from the superstructure, pulling in a guy wire from the number two traverse crane to hold the unit in place until he was ready to lift. Then he checked out the structural integrity of the module. The drawing showed the support points but Flaco was taking little for granted. Be a hell of a thing if the module fell into two halves when he lifted, with only one half fastened into the tackle. Even after he had ratcheted the chains and lifted the module out of place, he called the crane operator over the two-way and told him to hold while he checked the balance and the security of the rigging. When he was satisfied, he signaled the operator and gave the thumbs-to-the-ground signal.

"Not too bad," allowed Jimmy. "So far. You still gotta move it to the bay and unrig it."

Flaco stretched his arms back as far as he could and arched his back. "You gonna teach me to kiss girls, too?"

Jimmy shrugged. "You could find worse teachers."

"Watch it, down below! Crane coming." Red Hawkins, on the ship's 1-Level, was bringing across the number one traverse. The two cranes moved on parallel tracks, number one being somewhat higher than the one Flaco was using. "Hold up a few minutes, Chico. I need the crane operator for a while."

"Name's Flaco," Flaco told him.

"Whatever."

Flaco grinned and slid to the deck with his back against a bulkhead and his right leg dangling out the open side of the ship. "This is the part I like best," he told Jimmy and the two Bobs. "Goofin'."

Jimmy leaned out the side and looked down, holding onto the cross brace over his head. "You know," Flaco told him, "that as soon as we get outside, we can clue in the afternoon

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group to these little tricks of yours."

Bob-the-electrician smiled. "So, who uses the same tricks all the time?"

Flaco ran his hand along the inner skin of the vessel, by his head. "How come you guys aren't trying out for this job?"

Bob-the-electrician shrugged. Bob-the-pipe-fitter said, "I don't like the commute." Jimmy-the-rigger said, "Been there. Done that." Flaco looked at him.

"You been up?"

"I'm on the Gold crew. We lifted the first couple of ETs into 250-E. But the law says no more than six months up and then you get six months down, minimum, between stints. So O&P and the other contractors rotate crews. Blue crew is up there now. Red crew goes up next. You're Green—if you make the cut. You'll double up with Red crew for a while, until you learn the ropes."

"Crane coming through!" Red bellowed from above.

Jimmy looked up. "Nose lock," he said.

"Real bitch," said Bob-the-pipe-fitter.

The nose lock shifted in its tackle and Flaco pressed the red button on his two-way. "Crane," he said. "Load's come loose!"

Jimmy cupped his hands around his mouth and hollered to the workers on the floor below to clear away. The nose lock swayed back and forth under the now motionless crane. Red's face appeared from the next level up. "What the hell you playing at, Chico? You trying to screw me over?"

"The load's loose," Jimmy told him.

Red tossed his head in annoyance. "Shit." He spoke into his own two-way and the crane tracked back toward the ship. The nose lock turned and fell a few inches. Flaco made throat-cutting motions and Red stopped the crane.

"I can see underneath. A stay-bolt is working loose. Every time you move the load, it swings a little and pulls it out more."

"Double-shit gum. I leave it hanging and it will by-Our-Lady drop sooner or later." Red tugged at his beard. "How about I lower it real fast? I might get it to ground level before it comes loose."

Or you might not. . . . But it was Red's call. "Try it," he said. "I'll watch from down here and tell Crane to stop if anything happens. Did you hear that, Crane?"

"Gotcha." Flaco was glad to see the crane operator was taking things so well. But then, why shouldn't he? It wasn't him being tested. Flaco ran a hand across his brow. It was one hell of a test.

The nose lock began to drop and almost immediately twisted out of true. "Stop the drop!" Flaco told the operator.

The entire rig was now level with where Flaco stood on the decking. He couldn't see the loose bolt any more. "King!" he called. "How does it look?"

"Bad," the Louisianan hollered back from the next level down. "The one stay is out entirely. Putting a bad strain on the others. You got three lines and God holding it up."

God, he felt, could be relied on, but he wasn't so sure of the other stays.

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"OK." Flaco put the two-way to his face. "Crane, what do you have on the pivot arm up in the ceiling?"

"Hook and ball, why?"

"Run some tackle out there and swing it over. We can run a basket rig under the nose lock and lower it using both cranes."

"I don't know. . . ."

"Do it!" Flaco had no authority to give the orders. But someone had to do something, fast. He looked to Jimmy, who scowled and nodded and leaned out of the ship to make a thumbs-up gesture to the control booth.

The echo of the motors tripping in the ceiling emphasized how silent the maintenance hangar had become. Flaco watched as several cables of chain tackle ran out the pivot arm, which then swung across the room until it could drop the line between the nose lock and the ship. Flaco guided the operator using the two-way until the ball-and-hook dangled just outside the ship.

Flaco swallowed and gave a nod to the three men with him. Then he clipped his safety line to a cross bar and, before he could remember what a fool he was, stepped across and into the curve of the hook.

It was a big hook, strong enough to hold more than a mere human—and a skinny one at that; but Flaco could not stand comfortably except on one foot. He clipped his second line to the lanyard on the hook cable. Jimmy unclipped the first line and it rolled up into its reel on Flaco's belt. Flaco wrapped his arm around the crane cable and gave him a nod, trying to look unconcerned. Jimmy gave him a salute. "See you in heaven."

The cable danced and swayed. Flaco looked up to see Red Hawkins clipping himself to the line farther up. "We don't have to both be out here," Flaco said.

"Fuck you, Chico. This is my job. They unhooked your load down below and brought number two crane over to the other side of my load. I'm going to transfer over. You bring the fly end of the tackle underneath and I'll run it up the other side. Then we'll do the same thing with the second strap. You got a problem with that, Chico?"

"No problem. Like you said, gringo. Your job."

"And don't you forget it."

Flaco waited until Red had secured himself on the other side of the nose lock, then gave the crane operator the go-ahead to lower them both. When they met underneath, Flaco handed Red the free end of one of the chains. He was acutely aware of the massive structure dangling over him. He could *feel* its weight curling the hairs on the back of his neck. He said, "It would be tragic if the rigging gave way now."

Red grunted and looked up. "Yeah, it'd be the end of a beautiful fucking friendship. But look again, Chico. It ain't the rigging giving way, it's the nose lock. Fucking corrosion is what it is." He fixed the end of the chain to his crane. "And damn me if I'll let you look good at my expense."

They finished the job without speaking. When the basket rig was secure—and they checked *that* six ways from Sunday—Red gave the signal to

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the crane operator to lower away on both cranes. The nose lock swung as the new lines took off some of the weight and its center of gravity shifted, but it reached the ground without incident. The other candidates and the Pegasus people burst into applause as Flaco dropped off the hook onto the floor. Meat, up on the catwalk, gave him a thumbs-up. Red slid down a free chain from the traverse beam. He glowered at the nose lock while he tugged his heavy canvas gloves off. Flaco tucked his own gloves in his tool belt and offered his hand.

"Good work, man."

Red slapped his gloves against his left palm. He looked like he wanted to punch out the mechanism. "I always do good work, mate." He turned away without shaking hands and faced White Hat, who had come over and was squatting by the nose lock. One of the men in the brown coveralls was kneeling by his side, and they were conversing in low tones. "So, what's the verdict?" Red demanded.

The brown-coveralled man held up fingertips covered with rust. "It appears to be salt water corrosion, but we cannot be sure yet."

"No, blimey. I meant the goddamned test!"

White Hat looked up. "The results will be posted this evening," he said.

Flaco grabbed the examiner's sleeve and tugged him around. "You crazy, *'mano,*" he shouted. "What kind of test was that? People could have been hurt; killed, maybe!" He threw his work order, his exam paper, to the ground. Red stepped away from him, as if to dissociate himself from the outburst. Tomorrow Flaco would curse himself for yelling at the examiner and blowing his chances for the job, but right now he didn't care.

White Hat flushed, and his ears grew a prominent red. He stood up and yanked his sleeve from Flaco's grasp. "Get a grip, kid," he said. "We don't play things that way. You may not be worth jack shit, but that nose lock is sure as hell valuable hardware."

Flaco stood back and his arms fell to his side. "It wasn't? . . ."

"A test?" White Hat snorted. "Of course it was. It just wasn't planned."

Flaco flew into JFK on US West. Serafina was waiting for him at the end of the concourse and nearly knocked him over when she jumped into his arms. They were standing in the middle of the flow of traffic, but Flaco didn't care. For every glower they got from an outta-my-way businessman they got five smiles from people who remembered what love had been like.

"Oh, Flaco, I missed you," she said between rapid-fire kisses.

"And I missed you," he said, lowering her to the floor.

"Ha," she tucked her arm through his and they made their way through the crowds toward the shuttle bus. "You out there in the sunny desert with all those Mexicana women to tease you. . . ."

"I did not see one 'Chicana half so beautiful as you." And it was true. Others might argue that Serafina's nose was a little too big, or that her breasts were not, or that her legs were too short, but not Flaco. He

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could remember the women in the New Kon Tiki, their golden brown and tan skin, their easy availability; but worn, and old before their years, and none so fine on the eyes as Serafina. Serafina's love was free, and he had paid for it the ultimate price: the rest of his life.

For dinner that evening, Flaco took Serafina to Mambi on Broadway. It was a warm night. A night that wanted walking. They strolled cross-town arm in arm, letting silence do for words. August 16 was only a week and a half off, and a festive mood was beginning to build in the neighborhood. There had been Dominicans on Manhattan since the late seventeen hundreds. Upper Broadway—here at the northern tip of Manhattan—was a Dominican Broadway and the clubs and theaters that lined the street pulsed to the merengue. The breeze carried the rich odors of *sofrito* and *mangu* and thick *guisados*. The *panas* and their *bombias,* the young men and their women, were laughing and dancing in the street, holding impromptu parties on the corners, or eating their mondongo with beans and wet rice. Not that the anniversary of Trujillo's capture meant anything to them. It meant little enough to Flaco, despite the long, impassioned stories he had heard at his grandfather's knee. Mostly third and fourth generation in America, the brightly dressed young men and women bubbling on the street knew the day only as an excuse for *alegría*.

Flaco exchanged greetings with a dozen friends in the few short blocks. Half of them did not even know that Flaco had been gone. A carefree bunch, even when care was called for. Here and there in the crowd Flaco marked older men in their thirties with hooded, predatory eyes, and he hugged Serafina closer to him. Danger wore an older face than it once did. There was safety in crowds, but it was never entirely safe.

Serafina had been expecting some *mamitas* with the greasy *pollo frito* piled in baskets, so when he led her to Mambi, she gasped and said, "Flaco! Can we afford this?"

Flaco grinned at the successful surprise. By midtown and downtown standards, Mambi was not terribly expensive; but they were so far up the island that you had to go a long way downtown just to reach Uptown, and by the standards of the Gonsalves-Mercado savings account, dining out was not a thing to be done lightly. "O&P paid us for the week of testing," he told her. "So now we can celebrate."

"Your coming home."

"That, too."

Serafina fell silent. She stared at the restaurant window. In her reflection, a small frown creased her brow and her fingers briefly caressed her stomach.

They both ordered the *costilla de cerdo con berenjena* that Mambi was famous for. Flaco ordered a wine. It was not so proud a wine as to have a year on it, but it did not come in a returnable bottle, either. He lifted his glass to Serafina and said, "To us. You an' me an' little Memo." Serafina smiled and touched her glass to his.

"The trials went very well, I think," he said after he had swallowed and

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set his wine down. "Met some good men. And a few assholes, too. They told me helping out your crewmates, regardless, counted for a lot of points." He grinned. Serafina took a bite of her eggplant.

"This is very good," she said, and developed an interest in her meal. "Mama came over while you were away. We bought a crib for Memo. And some clothes. Oh, Flaco! They were so tiny, I just wanted to cry."

There was no telling with women how they would react. Flaco smiled and tried to look confident. "Everything will be all right. You'll see." Sometimes, the thought of being a father terrified him. A helpless child, trusting him utterly, following after him.... He would have to provide for the little one. He didn't know if he was ready for the responsibility. He didn't know if he could lead the boy anywhere it would be worth his while to follow. Grow up, be a rigger like your Papita? Or a waiter, like your Abuelito? But ready or not, here it came. His hands trembled and he cut firmly into his pork rib with his knife. Did Serafina feel the same doubts as he did, or was it all chemicals raging through her body? It would never do to show his uncertainty to her. She depended on him to be the strong one. "The money I make on this job," he told her, "we set Memo up right."

Serafina's fork clattered on her plate. Flaco looked up. "What's wrong?"

"You are not going back, are you?"

"Of course I am. I passed the trials. I told you, didn't I?" Or had the subject never come up in the joy of reunion? Had he known somehow to avoid it?

"Flaco, you will die up there!" A few heads turned in the restaurant, then just as quickly looked away. Young people spoke of dying too often. The reason was well known, and a reason best not known. Flaco wanted to leap up and tell them they were wrong; that Diego's death had turned him from that forever. He was a man of the construction now, a rigger. A life that was not so exciting and paid not so well, but which might last long enough to see your sons and your grandsons. No one shot you through your window at night because you were rigging on the wrong street corner.

But his quarrel was not with these strangers, but with his love. Flaco's grip tightened on his fork and he stabbed his pork rib hard enough to send it off the plate. He had dreamed this weekend as a happy one of laughter and lovemaking, never giving a thought to Sunday afternoon and the long flight back to Phoenix. "I will not die," he said. Death was something that happened—to quiet old men or to flamboyant young ones, but those who might have wanted to see Flaco dead were themselves no longer quick.

"Hundreds of men have worked up there," he assured her. "Very few have been hurt, even in small things." He did not mention Anselmo Takeuchi and how the blood had flowed from the eyes and mouth of his exploding body. His was not an error Flaco would ever make.

"What if you are not here for little Memo? How will your son and I sur-

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vive without you?" Serafina twisted the napkin in her hands. Her eyes brimmed with tears. Pregnancy always made women more emotional.

"You will be provided for. The benefits are generous."

She pushed away from the table and jumped to her feet. "You are cruel, Flaco! What will I do for comfort in the night with nothing but money for your bones?" She fled without waiting for his reply. Another woman in the restaurant raised her voice.

"You tell him, sister! They can't treat us that way no more." She favored Flaco with a glare. Some of the men laughed and made motions with their hands or arms. "Show her who the boss is." "Stick it to her; that's what she wants." An elderly couple by the window, their lips pressed tight in distaste, bent over their *guisado*. Flaco pulled a couple of presidents from his wallet and threw them on the table without waiting to see what the bill was.

At the door, a solitary old man with his napkin tucked in at his neck stopped Flaco with a hand on his sleeve. "It will be all right, young man," he croaked in a voice harsh with cigarettes. "It is love that makes them mad. She would not hurt so much if she did not love you."

Flaco was not such a fool as to chase after Serafina. She had not run from him in order for him to catch her. Not this time. The thought of her alone on the nighttime streets worried him, but it was not as though Boriqua girls grew up any less savvy than Dominicans. She would go either to their apartment, or to her *mamita*. He would find her. They would "rendezvous," "match orbits," like the news people on TV were saying about the spaceship and the asteroid, a little more than two weeks from now.

He looked up at the sky, but the city lights were too bright, and there was nothing up there but a gray, pale shroud.

The merengue was pounding in Ysidro's bar off Dyckman Street, but with more than a little of that Milwaukee "goofball" in the mix that the older *panas* found so irritating. Not the pure sound, at all. Not Cibao; not even the southern style, with its log drums. But Flaco had come here for the drinks, not the music.

"Is it wrong of me to want to provide for her?" he asked Clotario, his best friend among those still living. He stared into his tall, thin glass of *El Presidente*. "Is it wrong of me to want to afford things for her?" His voice was slurred from the drinking. He could hear the soft, slushing sound of it, but he didn't care.

"No," Clotario said. "Of course not. It is only that she will be lonely for you."

Flaco drank his beer, set the glass down hard on the table. "Seven months training," he said. "Groundside and spaceside. But I will be back before the child comes."

"A long time," said Clotario, "for a woman to be without a man inside her."

"She will not be the only one lonely," Flaco said with a twist to his lips.

Clotario nudged him. "Ah, but

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there will be women on the crew, no? Even in space they have the secretaries. And you yourself mentioned a few welders and technicians."

Flaco stiffened. "Serafina is the only one for me. I have given her my pledge."

Clotario laughed. "Oh, you are the righteous one, Flaco." He made a mock sign of the cross and kissed his fingers. "Your lady welders may be as attractive as their own welding tanks, but you will see. They will grow more beautiful as the months go by. Never will they be as lovely as your Serafina, who is the most desirable woman in all the Heights, but . . ." leaning closer to Flaco, " . . . they will be so much closer."

Flaco turned his attention back to his beer. "One voice inside me says, 'Flaco, stay with your woman and take care of her during her months.' But another says, 'Earn the money you will need to care for her forever.' How often do such opportunities come for men in the trades?"

"There are other trades," Clotario said casually. Flaco gave him a dead look, and he shrugged. "Then, if you wish, I can look after Serafina while you are gone."

Flaco stared at him through the gauze of alcohol. Saw the easy smile on his lips; heard the smooth assurance in his voice. Before he was quite aware that he was doing so, Flaco had sunk his fist in the pit of his friend's stomach.

Clotario fell gasping for breath. Flaco found himself suddenly in the center of an open space, as the others in the bar made room. Ysidro reached under the bar and said, "Flaco, you and 'Tario take it outside." He made no other moves. Everyone stood very still. Flaco bent over the gasping Clotario.

"You do not touch my wife while I am gone."

Clotario lay with his knees tucked up, clenching his belly. "Flaco. I didn't . . . mean. . . ."

"You will not allow anyone else to touch my wife when I am gone. If anyone does, I will kill him. I give my word on that. Do you understand?" Clotario nodded dumbly and Flaco bent lower, putting himself in the man's face. "I do not give my word lightly. I have done so only twice. Once when Diego died in my arms, and once when Serafina and I stood together before God. And you, Clotario, know how well I kept my word on that first occasion."

The voice whispered to him from the alleyway on Dyckman. "Flaco," it said. "Hey. Flaco."

It was the street talking to him, he thought. When he turned, he saw a woman standing there, looking tired, feigning interest. "Long time, Flaco," she said.

Flaco made to pass by. She stepped out, took him by the sleeve, and pulled him into the alley. Flaco staggered after her, too woozy to resist. The alley was rank. The ancient bricks of the buildings were sweaty with runoff from the clogged rainspouts on their roofs. "What do you want, *bomba?*" he asked. But it was a stupid question, because he knew what she wanted. Her fingers told him.

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"I need you, Flaco," she whispered in his ear. Her tongue licked him there, sending a thrill down his spine. "They tell me you were good. Fast and clever. You can help me." She wrapped her arms around his neck and pressed herself against him, but the notion gradually soaked through the alcoholic mist that it was all a ruse so she could whisper to him.

"Jaime, he beats me alla time if I don' make enough tricks."

"Leave him," Flaco said shortly, and she laughed.

"Then who gives me powder? You could do that. You'd be nice to me. Nicer'n Jaime." She was drunk, too, Flaco realized, or high. He could have her here and in the morning she wouldn't even remember, and that would be like it never happened.

"I can be nice," he admitted.

"Jaime, he's getting a load tonight, from downtown. I know where he's gonna be. You're smart, they always said. You could nine Jaime and sell the shit and then you 'n me, we'd be fat."

"How much shit?" he asked, because his tongue, awakened by alcohol, was living its own, dangerous life.

"Ten keys, at least," she told him. "Mexican pearls."

Flaco pursed his lips. He didn't know street for pearls these days, but five years ago ten keys would mean thirty kilobucks, as much as a six-month tour on LEO.

Thirty kilobucks of Mexican pearl could also get you nined, but death was on the station, too. A nasty, lonely death, either way. And if all he wanted was a place for Serafina and himself, here was a way that was faster and only a little riskier. He could use this woman—he didn't know her name, though she obviously remembered him. He could use this woman to take "Jaime"—a nobody, but somebody enough to cast pearls—and then cut her or keep her, as seemed best.

Serafina was in bed when Flaco finally returned home. She pretended to be asleep, but Flaco knew it was pretense from the stillness with which she lay. He stood in the bedroom doorway, bracing himself with one arm on the jamb against the swaying of the floor. The August night was too hot for sheets, too hot for nightgowns. Serafina lay beautifully uncovered, wearing only her white lace underwear. Flaco's breath came shorter.

He could take her. She probably wanted him to take her; or else why was she lying just so? He had never forced himself upon her. But he had never struck and threatened his *pana* before tonight. And if tonight was the time to rediscover the old Flaco, the Flaco of the careless streets, then perhaps it should be the whole man that was found.

But he turned away without disturbing her. The old Flaco was best left buried. He closed the bedroom door gently and found his way to the couch in the outer room, where he lay down carefully. A two-room, walk-up flat in upper Manhattan. It was little enough, but it was theirs. Their names were on the lease. But how he dreamed of escaping! A house, with trees, and a yard where Memo could run and play and grow tall and strong.

Sleep would not come. After a

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time, he rose from the sofa and walked softly to the open window. He sat on the sill, looking down at the nighttime. The crackling neon signs of the twenty-four-hour cafés; the blinking traffic lights at the corner; the furtive men and women conducting their business in shadowed doorways, in parked cars, among the children's playthings in the little park where the streets all came together. A black car rolled up Fort Washington Avenue, slowed at the intersection and turned right. No one paid it any mind. Not the hustlers; not the hookers. Not the couple standing in the doorway to the transient hotel, whose rhythmic movements never missed a beat. Not the whiskered old man with the strap still around his arm, staring where the stars ought to have been, pulse thumping to a rhythm no one else could hear.

He wondered if the woman had been setting him up; if this Jaime was someone who had reason to remember old scores. Most likely, she had been tempting each man as he came and would continue to do so until either Jaime heard of it and nined her or someone took her up and got both of them killed. By turning her down, Flaco had undoubtedly condemned the next man along the street to a nasty death.

And yet, every man thought he had the *cojones* and the brains to carry off such a play.

Flaco turned away from the window. It was not Serafina he had to save. It was not Serafina he had to pull away from these streets. As long as he could hear their siren call, the old Flaco would never stay entirely dead.

Saturday was strained, and he and Serafina spent their time not in lovemaking, but in making arrangements to sublet the apartment. It made no sense for her to stay there alone all those months. She would move back with her *mamita*; he would put his things into storage. Flaco's parents would take care of the lease and keep an eye on things. When Flaco spoke to his father over the phone, *papita* gave no hint whether he thought Flaco wise or foolish, but that had been papa's way, as far back as Flaco could remember.

After that—after he had helped Serafina move back to her mother's place in Spanish Harlem—it made no sense to wait for Sunday evening. So, after one last night in their apartment, he turned the keys over to *papita* and caught an early-morning flight back to Phoenix. For the first Sunday in the five long years since Diego went down, he missed Mass. ■

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Charles Sheffield

WAITING FOR THE RIDDLERS

They gave new meaning to the phrase "nagging uncertainty. . . ."

Humans and Riddlers may have misunderstood each other from the first moment of contact. That is one conclusion of this report. It is also, if I may be allowed to interpolate a personal statement as the official head of Earth's delegation, our probable best hope.

The problem was partly one of *expectations*. Mile-long spaceships; vast flotillas, girdling Earth in their thousands and bristling with weapons; subtle ethereal messages, drifting in as radio signals from the stars and requiring painstaking decoding after their detection.

Sorry; none of the above. No one, in all the millions of words written about first contact, had told us to be ready for a single, stubby vessel. No one had told us to look for four fronded purple plants sitting in garbage cans of dark soil.

Even after the first shock, we didn't do well. How was our delegation to know that the plants were no more than a habitation, and the Riddlers themselves comprised a commensal intelligent multi-cell mold that lived among the roots?

Luckily, they took it very well. Maybe I should say, *we thought* they took it well; with the Riddlers, you could never be sure of their thinking. I can be sure, though, that their interpretive equipment produced a most realistic chuckle of amusement when I explained our misunderstanding.

"Not a problem," it said. "It takes all sorts to make a Galaxy. This won't count against you when it comes to acceptance within the Federation. Why, we doubt if we'll even bother to report it."

Words intended to reassure (I think) but also enough to alarm me

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and the other five delegation members who had flown with me up to the Riddler ship.

"What *will* count against us?" I asked.

"Very few things. Of course, it would be a mistake to fire any more of those silly nuclear rockets at us. A number of Federation members strongly believe that new applicants ought to be potty-trained before they are considered eligible for admission. But we happen to believe other criteria are more important. Go back home and wait. We will beam down to you three questions, in increasing order of difficulty. Your answers, provided to us in each case within twenty-four hours of asking, will be used to decide your eligibility."

Note that *they* did not say "riddles." The name that the media of Earth gave them, the Riddlers, came about only because of their first question. They termed it the *establishing question*.

"What is it that walks on four legs in the morning, two legs in the afternoon, and three legs in the evening?"

An odd beginning, for beings with no legs at all. Or was that itself a hint, offered to us at the very start? I've wondered about that, a hundred times. Suppose the tubs of soil and the fronded plants housed nothing but transmission and receiving equipment, and the Riddlers themselves remained far away? Suppose they did not want us to know their true shapes, for good and sufficient reason?

Those suspicions only came to me later. At the time the question seemed so simple and familiar that we were at first reluctant to give the answer. However, we couldn't think of any sensible alternative, so twelve hours after we received their transmission I sent our answer to what has been known to humans for four thousand years as the Riddle of the Sphinx: "The creature that walks on four legs in the morning, two legs in the afternoon, and three legs in the evening is a human being."

"Thank you." Their reply came at once. "Sounds fine to us, but if you will please wait. . . ."

What alternative did we have? Their ship zipped away from Earth orbit, with an acceleration that made it clear they had the inertialess drive we have wanted for so long. One day later the Riddlers were back.

"The second question we will term the *question of judgment*," they said. "Who is the greatest human who has ever lived? It is desirable that humans agree on the answer that you provide to us."

If the first problem had been trivially easy, this one was impossibly hard. The *greatest* human? What did the adjective mean? Was it a trick question? Did *all* humans have to agree on the answer? How significant was the fact that the Riddlers had *giggled* in the middle of the transmission?

We had twenty-four hours. We could have spent twenty-four years without reaching a consensus. We didn't know how the Riddlers judged greatness, and requests for clarification produced no answer from them. Greatness might be scientific, artistic or religious. It could mean the tallest or fattest human. It might be in terms of all-around accomplishments, rather

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than achievement in only one field. It could even mean—though no one but Admiral Rawson supported the idea—the most successful military conqueror.

The arguments back on Earth were horrendous. Twenty-two hours of heated discussion produced bunches of candidate names. Christ, Shakespeare, Napoleon, Mozart, Newton, Confucius, Bach, Moses, Da Vinci, Mohammed, Aristotle, Julius Caesar, Einstein, Buddha, Socrates, Imhotep. . . .

Twenty-two hours also proved that humans would never agree. Moslems vetoed Christ and Buddha. Artists vetoed scientists, scientists poohpoohed the list of artists. Minority groups complained of Western Judeo-Christian bias. Feminists objected to every name, and proposed an all-female slate of candidates.

Consensus? Forget it. But no answer was the worst answer of all. As head of the delegation, I was forced to make a decision. I sent our reply: "The greatest human who ever lived was the one who discovered the use of fire."

It was a cop-out, of course, since we could not offer a name. All I can say is that we avoided all problems of race, color, creed, religion, gender, and sexual preferences, and *someone* had to decide.

"Very good," the Riddlers said. "A most interesting answer. If you will please wait. . . ."

Their ship vanished, as rapidly as before. This time we waited for over three weeks, biting our racial metaphorical fingernails. Finally the Riddlers returned.

"The last question we will term the *question of ethics*," their transmission said. "It is more complex than the first two, so please listen carefully. Are you ready?"

"We are ready." But I wasn't sure what the Riddlers meant by "ready," and I crossed my fingers when I said it.

"Let us suppose that you are accepted into the Universal Federation of species. As you expand through the Galaxy, you encounter numerous other star-faring civilizations. Suppose that you meet an unscrupulous and ambitious race, which, following an Earth tradition, we will call the Bad Guys. The Bad Guys seek to gain an advantage over humans, but they do not know you well. To learn as much as possible about you, they undertake a diabolical experiment. On a remote Earth-like planet, far off the usual space-lanes and with no intelligent life, they introduce a tribe of animals genetically close to humans: chimpanzees, brought there from Earth. However, by means of an externally imposed radiation field, the Bad Guys raise the intelligence of the chimps to match the intelligence of humans. The Bad Guys can then observe the development of a native civilization on the planet, without ever allowing their own presence to become known, and they will learn more about humans. Do you understand?"

"Certainly. But we have not heard a question."

"We have not yet asked one. To proceed: humans, traveling those far-off regions of the Galaxy distant from the usual spaceways, discover the planet on which the Bad Guys are conduct-

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ing their experiment. The Bad Guys flee, leaving intact the engine that generates the intelligence-enhancing field. It is discovered by the human explorers.

"The humans now face a dilemma. Suppose that they go away and allow the augmenting field to remain in operation. Then, when the elevated chimps achieve spaceflight and move beyond their home planet, the brave explorers will decline to animal intelligence and be unable to operate their ships. They will inevitably die. The way to the stars will be closed. The alternative is to turn off the field, allow the chimps to lapse back to primitivism, and hope that time and evolution will permit the development of a naturally intelligent species on the planet. Do you understand all this?"

"Completely."

"Then here is your question: What should the humans do?"

This time, oddly enough, there was almost no disagreement among the thousands of human groups who had fought so bitterly about the answer to the second question. We could have sent our answer within a few hours. I waited, but only because it seemed impolite to offer a quick answer to what the Riddlers had said would be the hardest question.

Finally I beamed our consensus: "To an intelligent creature, the loss of intelligence is as bad as or worse than death. If the radiation field were to be turned off, an intelligent species would be destroyed. That is unconscionable. The field must be left on, and the humans must go away."

"Very interesting," said the Riddlers. "Thank you. That is an illuminating answer. If you will please wait. . . ."

The ship again did its high-acceleration vanishing trick. We waited.

We are still waiting. It has been almost a year and a half since they left, but there is no sign of the Riddlers.

I do not think that they will be coming back. We failed the test. It is as simple as that.

Isn't it?

I would certainly like to think so. ■

MOVING?

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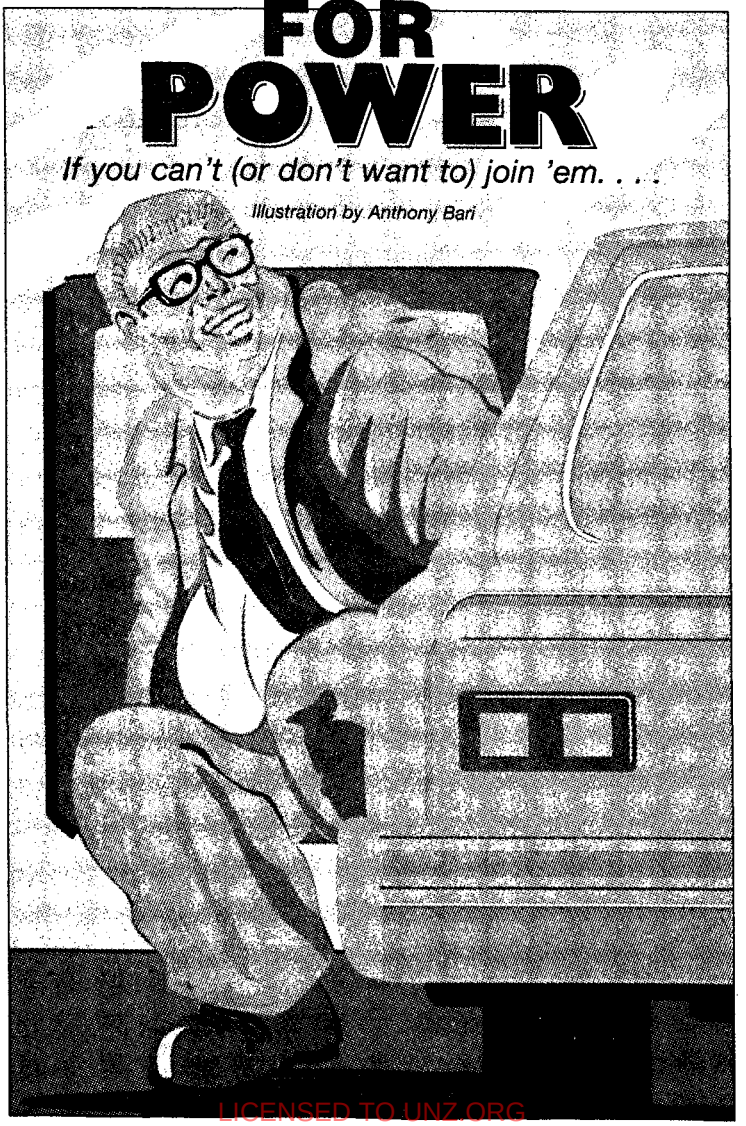
Kevin O'Donnell, Jr.

AN APPETITE FOR POWER

If you can't (or don't want to) join 'em. . . .

Illustration by Anthony Bari



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William Field grunted in discomfort as he squeezed his bulk behind the wheel of his car. Why did they have to make these electrics so small, anyway? Barely room in them for a dwarf, much less a tall man of, er, ample proportions.

"Ample proportions"—so much kinder than "outsized," the currently preferred term in Silicon Valley.

He thought fondly of Munich, which he visited on business three or four times a year. Now, *that* city respected ample proportions. Nobody there looked down on you for having a waistline larger than your inseam. They rather preferred it, in fact. If Germany would just cut its tax rates, he would not only move there, he'd even learn the damn language.

He slid his driver's license and insurance card through the magnetic stripe reader on the dashboard computer. The system awoke the cellular modem, queried the remote databases, and verified his right to drive. When the OK flashed, he put his key into the power-on switch lock. The center of the steering wheel irised open. He scrunched down, kissed the breathalyzer mask built into the steering column, and breathed until it beeped.

As a bio-genetics researcher, he knew and admired the durable simplicity of that breathalyzer. As a driver, he found it annoying. As a man who liked a beer or two with dinner, he hated the damn thing.

He wished he could take the bus. It would pick him up a hundred yards from his front door, and drop him off kitty-corner from Jackson's Famous Ribs. If he could take the bus, he could sip one ice-cold Dos Equis while waiting for his platter of ribs, and a second while stacking the bones.

But no, he had to drive, because it was the evening rush hour, and during the evening rush hour, not one bus in twenty permitted the outsized to board.

Well, he thought grimly, if you don't want your buses crowded, you'll have your streets congested, then. All the same to me. I'm going to be uncomfortable no matter what.

He turned off the Lawrence Expressway onto Stevens Creek Boulevard, and found himself at the ass-end of a mile-long traffic jam that stretched all the way to Wolfe. He drummed his fingers on the wheel. His stomach growled the bass line. "Yeah, yeah," he told it, "I hear you. I'll go down a side-street as soon as I can."

Police barricades at Tantau put paid to that plan. Another random stop-and-search. "Pfui!" He slumped in his seat. The roadblocks served their purpose, he'd grant them that, but by God did they screw up traffic. Especially the STD sweeps—the blood tests on those took fifteen, twenty minutes apiece to process. Even when the cops only pulled over every tenth driver, that still double-parked so damn many cars that the broadest of roadways pinched down into the worst kind of bottle neck.

The state of the boulevard reminded him of some work in progress at his lab. *His* lab, yes, even if Jennifer had gotten a third of his founders' stock in the settlement. Along with the

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house and the '97 Lincoln Town Car, the last American-made car big enough to accommodate him. She'd taken that just for spite, the anorexic bitch.

He shouldn't have expected anything different, though, not in California. The leotard brigade had pretty well overrun the whole damn state. Health-club hens everywhere you looked. All of them counting their calories, watching their waists—and doing the same for you whether you wanted them to or not.

Oh, sure, it made for nice scenery. Trim and taut bodies everywhere. A mall bench proved an ogler's paradise. And the fringekinis at the beach could break a sweat on the statue of a saint.

But, jeez. Take a woman out to dinner, she'd spend half an hour grilling the waiter about the oils, and the sauces, and the possibility of getting celery sticks instead of rolls. Or you go over to her house, and she serves up something mostly green, arranged on its plate as carefully as a bonsai, and about as nourishing. Over in the corner of the kitchen, her cat (and they all have cats) is smirking at you, and refusing to swap dinners.

He sighed. Twenty-five years on the Left Coast should have inured him to its idiocies, but no, he still reacted as he had when he was a fresh-from-Kansas-man at Stanford. He ached for the women when he saw them on the streets in their bike shorts and sports bras—and ached to get away when they sat on the other side of the table from him.

Where did all the big ones hide? He knew they existed. He'd seen them in the supermarkets, whisking cookie bags off the shelves saying "they're for the kids," or hefting inch-thick steaks at the meat counter while murmuring, "My husband, he . . ."

But where did they go afterward, and why couldn't he ever meet an unmarried one?

Jesus. If only he could find someone he could take home to Kansas, someone who'd smile at Ma and ask for more gravy, someone who'd figure that the right thing to do after dinner was eat dessert.

But no. He wasn't going to run into her in California, unless maybe she'd just gotten off the boat from Samoa.

Californians. They just couldn't figure out which arteries to keep clear. . . .

Ah, well. All those skinny bigots were going to make him rich. Again. And since he could prove he hadn't started the project until after the divorce was final . . . oh, my, would that drive Jennifer crazy, for him to be rolling in money and her unable to filch even a bit of it. Teach *her* to sell her holdings to Pfizer.

The project itself would upset her even more. She had a Puritan streak to her, or maybe a tinge of Calvinism, he wasn't sure. Whatever; that didn't matter. What did matter was that she believed nothing had any value unless earned through hard work and sweat.

And his next product would give a slim, trim body to anyone who wanted it.

He'd code-named it "Dr. Field's Cure for Cookies"—a silly name, to be sure, but he liked it, and it would do for the time being. He'd hire a marketing type to come up with a better name when it was ready for FDA testing.

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He hadn't worked out all the details yet, but he had the outlines down. Dr. Field's Cure would alter a few patches of cells in the brain—the ones that, relying on feedback from the alimentary system, control the speed at which food moves through the gut.

Those cells ask various parts of the gastrointestinal system what they're holding, and calculate a calorie/volume ratio on the answer. Then they send back instructions, saying either "That's low-value food; move it through quick to make room for more," or "High-value food! Take your time with this; suck all the goodies out of it before you push it out the other end." (Field had long ago decided this was why his body extracted less than 90 percent of the calories available from say, a celery stick, and nearly 98 percent of those in a Snickers bar.)

Dr. Field's Cure would mislead those cells into issuing the double-time order.

In a strange sort of way, exactly that was happening on the boulevard ahead of him. The commuters moved along Stevens Creek just as food travels through the intestines. The system controller—in this case, the police department—decided that the flow held value: arrests to make. So it slowed the flow in order to examine it as closely as possible, and to suck all the goodies out of it before dumping it into the next town over.

But damn, it was inefficient, and that ticked him off. He'd bid on supplying those blood tests, yet had lost the contract because his test cost ten cents a unit more than the competition's. Damn city hadn't considered processing time at all. *His* test ran in an average two minutes forty-seven seconds, easily five times faster.

Damn city. A lot more sensible in Munich. But then, over there, they knew the importance of keeping vehicular arteries clear, and leaving the thoracic ones to the discretion of their owners.

Shaking his head, he rolled down his window. He hoped it was a weapons check. Those went quickly. Even the drug searches were tolerable, when the cops had enough dogs.

On the other side of the street, a middle-aged couple in sweat suits jogged slowly down the sidewalk. A cop stopped them. When they raised their left wrists, the evening Sun glinted off laminated plastic. The cop peered closely at each bracelet.

Field chuckled. God, he loved to see fitness freaks forced to produce their running permits. Silly health nazis, limping through life with swollen ankles, shin splints, bad knees and aching backs, all in the pursuit of health. Great hearts and lungs, of course. Those folks wound up with cardiovascular systems tough enough to keep them alive through a few hip replacements, a decade of Alzheimer's, and who could know how many years of incontinence?

The cop pulled a flashlight from his belt and shone it in the eyes of the male jogger. The man recoiled. The cop's other hand dropped to his holster; his mouth worked. The man gestured vigorously—the woman patted his shoulder—the man stood still. A moment later, the cop was cuffing the

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man and marching him over to a small blue and white van parked at the corner.

"Yes!" Field laughed long and loudly, and beat the steering wheel with the heel of his hand. Oh, God, it was sweet to see a runner busted for suspected endorphin intoxication.

He wanted to lean out his car window and shout, "Still think the War on Drugs is a good thing, Marathon Man?"

Field kept his mouth shut, of course. Not only would hurling a question full of insult have attracted undue attention, he doubted his shoulders would fit through the window frame.

Besides, the Endo-Intox test belonged to him, and his firm was just about to make another dollar forty-nine. . . .

Three miles and ninety minutes later, he parked in the lot alongside Jackson's Famous Ribs, and began the laborious process of exiting the vehicle. He hit the "Disembark" button on the dashboard computer and followed the checklist required by law.

Tires at 45 degree angle to the non-existent curb, check.
Parking brake on, check.
Lights off, check.
Environment control system off, check.
Car phone off, check.
Radio off, check.
Antenna retracted, check.
Windows closed, check.
Power-on switch key removed, check.
Steering wheel clubbed, check.
Smoke alarm functional, check.
Seat belt removed, check.
Passengers disembarked, check.
Passenger doors locked, check.
Car alarm triggered, check.
Dashboard computer into standby mode, check.

And now he had sixty seconds to pop the driver-side door, heave out his six-foot-four, two hundred eighty-pound body, close the door, and turn the key in the lock. If he didn't make it in time, the siren would go off, and he'd have to pay another goddamn false-alarm fine.

He made it with three seconds to spare.

Grumbling under his breath, he walked to the front door of Jackson's Famous Ribs, pushed it open, and stepped into a checkroom barely larger than an airlock.

Oh, Lord, it smelled good. He inhaled again—.

An alarm in the upper left corner of the chamber beeped. The inner door snapped its lock shut before he could push it open. The sign on the wall cycled through "No Smoking" and "No Scents" to "No Outsizes."

"What the hell?" he said.

The man who was trying to enter behind him said, "Oh, come on, dude, you've seen it before, you know what it means. And like, you're in our way, 'kay?"

Ignoring the man, he knocked on the inner door.

Jackson L. Poincaré, III—proprietor, chief cook, and bottle-washer—came over. He wiped his hands on his apron and looked embarrassed. Opening the inner door a crack, he said, "Oh, shit, Bill, I am *so* fuckin' sorry.

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Oh, man, this . . . let's talk out there, hey?" He gestured to the sidewalk.

Field sighed, and tried to turn around, but the checkroom was small.

"Jesus Christ," said the man behind him, "you mashed my foot, you fat ox!"

Repressing the urge to respond in kind, Field said, "Sorry. Would you mind letting me out, please?"

"You shoulda known better'n to try to get in the first place."

Patience gone, Field said, "In that case, you should have known better than to try to follow me in here. Now are you going to let me out, or am I going to have to step on you again?"

"Whale." The guy shoved him in the back.

"Shrimp." He shifted his bulk and lifted his foot.

"All right, all right!" The man had fear in his voice. "Come on, we're out of your way, now you get out of ours."

Field wheeled slowly about. The man and a woman stood just outside the restaurant. The man held the outer door open; the woman studied the tips of her pumps. They looked health-club-trim and treadmill-fit. He despised them on sight.

When he and Poincaré were alone on the sidewalk, he said, "Jesus, Jackson! Why in *hell* did you install that obscenity?"

"You mean the Outsize Measurer?"

"Yes! Good God, Jackson—"

"Bill, my man, wasn't my choice. A sister from the Health Department came by yesterday. The new ordinance went into effect. I *got* to have that Outsize Measurer—hell, she told me I had twenty-four hours to put one in or get shut down." He shrugged. "This is what I *do*, man. Can't afford to close up."

"But Jesus, Jackson!"

"Hey, it's the law! I don't like it no better than you do. And you can still go 'round back for take-out, you know."

"What, with Jeff and Charlene and the others?"

"Hey." Poincaré shrugged again. "It's the only option we got, man."

"You want me to risk my health by standing alongside smokers?"

"Bill—" Poincaré clasped his shaved head between his hands— "man, I keep telling you, this ain't my choice. You think I *want* to do this to my best customer? Shee-yit."

"C'mon, Jackson, you of all people ought to see that this is discrimination, pure and simple."

Poincaré smiled faintly. "Bill, homey, did you complain when the inspectors made me install decibel-readers at every table?"

"That's different."

"Yeah? OK, did you gripe when I had to put in the sniffers to check for perfume, cologne, and body odor?"

"Jackson, you can't compare—"

"Don't give me that. I sure can. You know how much business that cost me? Now tell me, Billy my main man, did you bitch when the place went no-smoking?"

"What, are you kidding? That was the smartest thing you ever did."

Poincaré gave a pained smile. "Uh-huh. You know, I didn't want to do it, but all the non-smokers really loved it. Probably why the Board of Supervisors passed the ordinance. Business fell off, but hey. *You* liked it."

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"What are you saying?"

Poincaré regarded him for a moment before replying. "Nothing, my man. Except that the law's the law, now. You go 20 percent over ideal weight for your height, the law says you don't get to come in."

"Jackson, c'mon, I've got a big frame and a slow meta—"

"Bill-iiieee! It ain't my idea, you get that? And it ain't my hardware, either. You want to change this shit, you go talk to the supervisor from your district. Trust me, I never would have done it if they hadn't made me." He patted Field's paunch. "You've been my meal-ticket a long time, you know?"

"I appreciate your seeing me on such short notice, Supervisor."

Janet Davidoff smiled beautifully. "To be honest, Dr. Field, it isn't a privilege I extend to just anyone. But then, not everyone is founder and lead researcher at a major bio-genetics concern headquartered in my district." She blinked. If she weren't the most powerful member of the Santa Clara County Board of Supervisors, Field would have thought she was batting her eyes. "Now, Doctor, what can I do for you?"

He smiled back. "You can act to keep that 'major bio-genetics concern' here in the Valley, instead of watching it move to Munich, Germany."

She looked genuinely alarmed. "Doctor, I can understand why you might find a Common Market factory necessary, but why would you want to relocate corporate headquarters?"

He stared at her for a moment, then quite deliberately laid a hand on his belly. "You wrote the 'Fatso Get Out' law, right?"

"Please, Doctor." She sat up straight in her chair. "I know that a few newspaper columnists have called it that, but the proper title is 'An Ordinance Regulating Permissible Public Venues for the Outsized.'"

"Yeah." He made a rude noise. "The gist of it, though, to quote your ordinance, is that 'any commercial facility open to the public shall be required to install in its entryway an Outsize Measurer empowered to exclude from the premises, without regard to sex, race, ethnic background, age, religion or lack thereof, or sexual orientation, any individual of a weight greater than 120 percent of that ideal to his or her height, and a body-fat percentage greater than 15 percent.'"

Her shoulders rose and fell. "Yes. So?"

He suppressed the urge to growl and slap her desktop. "Good God! That's blatant discrimination!"

"Not at all, Doctor. For one thing, federal law defines discrimination in terms of 'sex, race, ethnic background, age, religion or lack thereof, or sexual orientation.' For another, it's obviously a public health measure."

"'Public' health!?"

"Doctor," she said, making an apparent effort to remain patient, "surely you know that now that we have virtually eliminated the use of tobacco products, the leading cause of death in America today is outsizedness?"

"First, that's crap—"

"Statistics don't lie, Doctor."

He gave a Bronx cheer. "Statistics

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jump through any hoop you want them to. I've seen the studies. They're full of it. Just for starters, they attribute any death by heart attack to obesity as long the deceased happened to be even few pounds above ideal weight at the time."

"A clear reason to eliminate obesity, then, isn't it, Doctor?"

He doubted it was coincidence that as she spoke, she ran her right hand along her flawlessly trim side. "People have heart attacks for all sorts of reasons, Supervisor. Take stress, for example."

"Yes, do," she said. "Surely you're aware of the studies linking secondhand oversizedness to stress and thus to heart attacks?"

"My God!" He threw up his hands. "Those are the most slanted, bigoted—"

"Tsk-tsk." She waggled a finger at him. "A dozen independent researchers have found that the very sight of an oversized person is sufficient to provoke nausea, disgust, and high blood pressure in a propersized person. These are not health-promoting factors, Doctor."

"But those studies are nonsense! Good God Almighty, the researchers had to lower the standards of statistical validity by two orders of magnitude in order to find any sort of correlation at all."

"Those are the governing studies, Doctor. Besides—" she said before he could speak—"it's indisputable that the oversized pose other, equally serious health risks to the propersized. For example, you—ah, *they* are much more likely to suffer sudden cardiac failure. Those in the vicinity, as well as any emergency medical personnel responding to the call, are that much more likely to suffer physical injury attempting to move the oversized, or to lift them onto a stretcher."

"But that—"

She held up a hand. "More, the oversized exert greater force on all with which they come in contact. Furniture, for example. They weaken chairs, stools, benches, sofas, and the like to a much greater extent than a propersized person does. This vastly increases the likelihood of catastrophic furniture failure, and thereby imperils the propersized."

"Now, that, Madam—"

"Really, Doctor! Are you attempting to suggest that even walking down the sidewalk you don't stress the pavement to a greater degree than a propersized man of your height would?"

"But it's—"

"The math is inescapable, Doctor."

"Inescapable maybe, but relevant, no. Furniture and pavement are built to support much greater—"

"Only because the outsized walk—and sit—in our midst, Doctor. Were there no outsized, furniture could be built to lower tolerances and would, therefore, cost considerably less money. The annual national savings—"

"My God! That's raving bullshit!"

Her face froze. "Good day, Doctor. Pardon me if I don't see you to the door, but I'm sure you can find your own way out."

As he stalked out of the county building, Field simmered with rage.

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He *would* move the damn company to Munich. First thing in the morning he'd hold a press conference to break the news. He'd blame it all on Davidoff—he'd make it clear that she had cost the Valley a thousand jobs and millions of dollars in property taxes. That would end her career in a hurry.

Halfway across the sun-washed parking lot, he stopped to catch his breath. A warm breeze played across his face, drying his sweat. The car at his side urged him to move along before it called the police. He just groaned.

What was he thinking? He could blame Davidoff and her ilk all he liked, but it wouldn't work. Anybody who logged into the press conference would see his two hundred and eighty pounds. Newscasters wouldn't even have to speak to portray him as a whiner who picked up his marbles and went home when things didn't go his way—they'd need only to run the right video sound-bite to destroy his credibility.

And how could he counter the argument that he was just trying to cut costs by moving to a lower-wage country with laxer regulatory agencies?

"Oh, God!" It struck him that some media smart-ass would inevitably wink at the camera and call him yet another corporate fat cat.

"Unless you need medical assistance, sir," said the car at his side, "I will have to insist that you move along. I will call the police in ten seconds. Nine. Eight—"

"Yeah, yeah, yeah." Wishing he could shed those mental images as easily as a dog does water, he shook himself, and resumed his trek across the parking lot.

There was nothing he could do. He might as well go back to the lab, finish Dr. Field's Cure for Cookies, and make himself rich. Surely enough money, suitably donated, could do serious damage to Davidoff's political future.

Gloomily, he kicked a pebble, and had to make a hasty apology to the motorcycle into which it bounced.

The problem was, wealth had just lost some of its luster for him. Dr. Field's Cure would earn him a fortune—but the very act of introducing it to the market would implicitly endorse all of Davidoff's prejudices. Dammit. She and her kind were going to win out no matter what he did.

Even more humbling: without their bigotry and their legalized discrimination, the Cure might never earn back its development costs. There would have been a market for it in any event, but not such a . . . large one.

No, no, he couldn't bear for it to happen that way. Not without at least making sure she understood how wrong she'd been, how much hurt she'd caused. The woman needed a taste of her own medicine—

He snapped his fingers. Yes! That would do it, better than moving the company or costing her the next election.

Already chuckling, he hurried to his car.

God, Field loved the human body. He never ceased to marvel at it, or at its intricate media of internal communication. He was dealing with one

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such medium right then: the small islands of cells scattered through the brain that regulated the appetite. They apparently functioned on the basis of feedback from the bloodstream and the alimentary system. Whenever blood sugars hit a certain level, and the stomach held enough nutrients of the right sort, the tiny clusters of brain cells shouted out, "Cool it on the eating! We don't need any more food now."

And, of course, practically right next door to them lay that other clump of cells, the one that decided how much effort the gut should put into extracting value from the food flow. . . .

Field thought that by now he understood exactly how the brain and the GI tract managed to do all that. It looked like protein and sugar recognitions and analyses, for the most part.

Once he had realized that, the rest had come easily. He had started with a common virus known to prosper in the lungs without unduly harming them. He'd given it a special affinity, though, for slipping through the bloodstream to replicate in the harsh environment of the stomach. He'd added a little of this; he'd stirred in a touch of that. A twist here, a tweak there.

Presto. He had himself a virus that would rewrite the operating instructions of the alimentary system. Under certain circumstances, the edited system would underreport the volume of food it contained. Under those same circumstances, it would overreport the food's nutritional value, forcing a cluster of brain cells to issue the order: "Extremely high-value food going through; pump it slow; take lots and lots of time with it; we want all the calories it holds."

Field giggled as he put the finishing touches onto the virus. The average sedentary adult body needs about ten calories a day per pound to maintain its weight. A moderately active body, about fifteen. A body engaged in intense physical activity—say, a lumberjack—maybe twenty calories per pound.

On average, the consumption of 3,500 excess calories results in the addition of one pound to the body's mass.

Supervisor Davidoff, he estimated, weighed in at around 120 pounds, and (according to the newspapers, at least) spent an hour or more in the gym three days a week. So unless she had a bulimia problem, he could safely assume she was maintaining her weight on about 1,800 calories a day.

Figuring a standard health-freak diet high in items from the invertebrate column, and low in foods derived from things with legs or fins, her system probably ran at 90 percent efficiency. So she was mostly likely consuming 2,000 raw calories a day.

If he could ratchet her system's efficiency up to 95 percent for twenty-four hours, her gut would absorb 1,900 of those 2,000 calories. That alone would be enough to plump her out by a pound every thirty-five days.

But if he could fool her brain into thinking she needed 2,400 calories, so that it urged her to take in 2,667, because it expected her only to digest 90 percent of them, why . . . she'd be

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tacking on one pound every three and a half days. Two pounds a week. Twelve weeks until she crossed the line into outsized territory—the line she had drawn herself.

Of course, he couldn't set her system at those higher levels permanently. Oh, no. To higher standard settings, she could, and probably would, adapt. She had great strength of will, and a fervent desire to stay in office. She'd learn to live with constant hunger. In fact, as she grew accustomed to it, she would cease to recognize it as hunger.

No, this had to be a temporary, but recurrent, phenomenon. Something triggered by an external event; something that would last perhaps a day before fading away. It would take longer for her to cross into the realm she and her fellow bigots had proscribed, but that didn't matter. She would get there, sooner or later.

And she wouldn't be alone. Oh, my, no. This would be a mildly contagious air-borne disease. Not that sufferers would cough or sneeze. Simply, every tenth or fifteenth breath would exhale a virus looking for a new home, a virus that would die of dehydration within thirty seconds after leaving the lungs.

To infect someone, you'd pretty much have to be talking to him at very close range for a very long period of time.

Like the way politicians talk to each other when they're trying to muster support.

And even after infection, the virus wouldn't do much in the absence of certain circumstances. Oh, sure, it would be multiplying through the body, patching its genetic code into that of the cells composing the alimentary system, but that code would lie dormant until the system pulled its trigger.

Field beamed. The aerosol was ready. His next appointment with Supervisor Davidoff began in half an hour. He had already promised her assistant that he would apologize for his bad manners. And he would. He would bow, and scrape, and kiss her hand, and ask her opinion of the odorless room deodorizer he had just formulated.

She would love it. Or maybe not. Her reaction didn't much matter. All she had to do was breathe deeply within thirty seconds of his spraying it in the air around her. Could she resist that?

He smiled again. Such a simple solution, all things considered.

And such an elegant trigger, too. Chicken. Baked or boiled, fried or broiled, it didn't matter. The modified cells of the alimentary system would react to half a gram of chicken proteins, and cue the brain to "Keep eating!" and "Process this stuff slowly!"

And where did politicians spend most of their evenings, but on the rubber chicken circuit?

He figured a year before the repeal of all laws regulating the, ah, amply proportioned. Two, tops.

This pleased him to no end. He really hadn't wanted to learn German . . .

. . . And he'd always preferred ribs, anyway. ■

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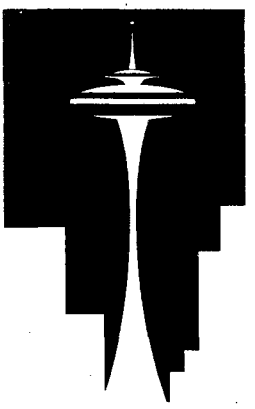
CLARION WEST



Applications are now being accepted for the 1997 Clarion West Writers Workshop in Seattle. This intensive six-week workshop prepares writers for professional careers in science fiction and fantasy.

Only 20 students will be selected for the workshop, which runs from June 15 to July 25, 1997. Instructors include Elizabeth Hand, Michael Bishop, Lucius Shepard, Samuel R. Delany, Beth Meacham, and Nicola Griffith.

Applications should be postmarked on or before April 1, 1997. A complete application includes:

*A cover letter discussing where you've been, what you've been doing, your writing history (if any), and why you want to attend the workshop,

*20-30 pages of typed, double-spaced original manuscript (1-2 short stories or a novel excerpt with outline),

*A non-refundable $25 application fee payable to Clarion West,

*Completed financial aid forms if applicable. (Limited financial aid is available; forms should be requested in advance by writing to Clarion West, or by calling 541/686-2605, or by email at 74634.2056@compuserve.com.)

Completed applications should be sent to Clarion West, 340 Fifteenth Avenue East, Suite 350, Seattle, WA 98112.

Participants can expect to pay tuition of $1,300, minus $100 if their application is postmarked before March 1, 1997. Dorm housing and college credit are available at additional cost.

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ANTIGRAVITY SIGHTINGS

Over 35 years ago, in an editorial published in the September 1960 issue of this magazine, the great SF editor John W. Campbell, Jr., broke the news of a new gravity-defying invention, the Dean Drive. It was a contraption of weights, gears, and springs, officially registered with the US Patent Office, that operated so as to produce an oscillating force. According to Campbell, when the Dean Drive was operating under power, it registered significantly less than its normal power-off weight on a bathroom scale. This was taken as evidence that a new antigravity breakthrough had been made and that one of the mainstays of physics, Newton's 3rd Law of Motion (conservation of momentum) had fallen. One *Analog* cover of the period depicted a converted submarine, operating under Dean Drive power, landing on the Moon.

Alas, the work reported by Campbell served principally to demonstrate that bathroom scales are not reliable instruments for investigating antigravity or for overthrowing the laws of physics. Later, more detailed, studies showed that the Dean Drive developed no net time-averaged force and that Newton's 3rd Law remained intact.

This Alternate View column is about two new reports of possible antigravity breakthroughs. Perhaps, like the Dean Drive, they will prove to be bogus. But the subject continues to have interesting SF implications, and the payoff, if an antigravity route out of Earth's gravity well could be found, would be enormous.

The first of these "sightings" was recently published by J. F. Woodward in the prominent journal *Foundations of Physics Letters*. I have always regarded proposed antigravity devices with considerable skepticism. It's likely that this work has a hidden flaw somewhere too, but it is certainly the most plausible I've seen. Woodward's paper reports an apparently successful tabletop laboratory test of Mach's Principle.

Let me begin by explaining what Mach's Principle is. The physical property of mass has two distinct aspects—gravitational mass and inertial mass. Gravitational mass produces and responds to gravitational fields. It supplies the mass factors in Newton's famous inverse-square law of gravity ($F_{12} = G\, m_1\, m_2/r_{12}^2$). Inertial mass is

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the tendency of matter to resist acceleration. It is the mass factor in Newton's 2nd Law of Motion (F=ma). One of the deep mysteries of physics is the relationship between these two aspects of mass.

Mach's Principle attempts to connect inertia with gravitation by suggesting that inertial mass comes from the long-range gravitational forces on a massive object from all the other masses in the Universe (so that in an empty universe there would be no inertia). Mach said that inertial and gravitational mass must be the same because inertia is a gravitational effect. Albert Einstein liked Mach's Principle and used its implications to formulate his famous *Equivalence Principle,* a cornerstone of general relativity, which asserts that gravitational and inertial mass are indistinguishable. In a small isolated room it would be impossible, according to the Equivalence Principle, to tell from local measurements whether the room was on the surface of the Earth in a 1 *g* gravitational field or in a rocket ship accelerating at 1 *g* through gravity-free space. The Equivalence Principle is now generally accepted in physics, but its underlying basis in Mach's Principle has never been properly understood or tested until now.

Woodward may have accomplished this. He has formulated a *nonlocal* mathematical theory embodying Mach's Principle. Woodward's theory can be tested because it predicts a remarkable effect: if the mass-energy density of a system is made to change with time, the mass of the system should vary by an amount that is proportional to the second time derivative of the density change. For example, if a capacitor is charged positively and negatively by a voltage that varies as a 10 kHz sine wave and delivers a power of 100 watts to the capacitor, Woodward predicts that the mass of the capacitor should vary from its normal mass by about 130 milligrams at a frequency of 20 kHz.

This is a prediction that can be tested in the laboratory, and Woodward has devised a clever way of doing this. He describes his method in terms of throwing a ball in the air. His explanation reminds me of the old puzzle of the Juggler and the Bridge: A juggler who weighs 252 pounds carries with him three juggling pins that weigh 6 pounds each. He comes to a bridge that has a precisely determined load limit of 260 pounds. How can he cross the bridge with his juggling pins without breaking the bridge?

The conventional (but wrong) answer is that if he juggles the pins while crossing the bridge, at any given time he will be supporting only one pin (with the other two in the air), so his net weight should be only 252 + 6 = 258 pounds. Therefore, it is concluded, he can safely cross the bridge.

Actually, the situation is not so simple. Every time the juggler catches or tosses a pin, his hand experiences a downward reaction force. This force is added to his weight as he stands on the bridge, producing a momentarily "spike" of increased weight. Newton's 3rd law requires that the time-average of his weight, including the increase spikes, must be 270 pounds, the same

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weight as if he were simply holding the pins at rest. Thus, if he tries to cross the bridge while juggling he will surely break it.

But now consider what happens if we provide the juggler with the advantages of Woodward's effect. Suppose that by some mechanism we can make the masses of the pins vary with time so that the weight of each has an average value of 6 pounds but varies with time between 2 pounds and 10 pounds. If we carefully match the weight variation to the juggling cycle so that the pins weigh only 2-pounds when the juggler catches a pin and throws it up, then his average weight while juggling will be only 258 pounds, the same as if he were juggling with three 2 pound pins. Then, assuming the bridge responds only to the average load, he can cross it without mishap.

Woodward's test of Mach's Principle works in much the same way. He mounts his mass-varying bank of capacitors atop a piezoelectric motion device which moves the capacitors up and down. By timing the upward push of the motion device to correspond to the mass minimum of the capacitor bank, he attempts to reduce the net weight of the system, which is mounted atop a sensitive electronic scale. Woodward's published measurements indicate a mass reduction of several milligrams as measured using signal-averaging techniques to a statistical accuracy of 10 to 15 standard deviations. He also reports a number of systematic checks which are in good agreement with the predictions of his theory.

Woodward's reported mass reduction effect is small, and both his measurements and his interpretation in terms of Mach's Principle need to be checked by others before they can be accepted as scientific facts. But, taken at face value, his result is a remarkable demonstration that *the mass and weight of an object can be reduced in the laboratory*. This would be a new physical phenomenon that raises a number of interesting questions. How can it be reconciled with the laws of physics? Can the mass change be used to reduce the net system weight to zero or less (antigravity)? Can the capacitor mass be driven to momentary values of less than zero (negative mass)? And so on. Woodward's paper does not confront most of these issues, but let me attempt to do so here.

(1) Conservation Laws: If the mass of an isolated object in motion changes spontaneously, either its kinetic energy or its momentum (or both) must change. As I read Woodward's paper, it is the momentum of the object that changes with the mass, while its kinetic energy remains constant. In other words, it is the law of conservation of momentum (Newton's 3rd Law) that is placed under attack by Woodward's effect.

However, Woodward, in formulating his version of Mach's Principle, assumes that the interaction of the isolated object with the other masses of the Universe is nonlocal, in analogy with the nonlocal character of quantum mechanics as demonstrated by the Einstein-Podolsky-Rosen experiments. Thus, Woodward's effect im-

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plicitly assumes an immediate nonlocal momentum transfer between the varying mass of interest and the rest of the Universe. Therefore Newton's 3rd Law is preserved, but in a rather peculiar way.

(2) Weight Reduction and Antigravity: Woodward's effect, as implemented in his measurements, produces a mass change of a few milligrams in a object that must have a mass on the order of a few grams. Therefore the fractional change in weight is 0.1% or less.

The question of burning interest to SF readers and writers is whether the weight-reduction effect can be made large enough to produce actual lift against gravity. The answer appears to be *yes*. The weight-reduction magnitude depends on the product of the mass variation and the acceleration applied to the varying mass by the piezoelectric motion device. The size of the mass variation depends on the amount of electric power flowing to the capacitor and on the frequency f of its charging current. The magnitude of the applied acceleration depends on the distance "stroke" of the piezoelectric motion device and on the square of the frequency (f^2) at which it is operated. This means that the overall size of the weight reduction should grow as the third power of the driving frequency (f^3).

Woodward's measurements at a frequency of about 10 kHz (a rather modest audio frequency) observed a weight change of about 1 part in 1000. Increasing the frequency by a factor of 20, to 200 kHz, while holding the other variables fixed (if that is possible) should make the weight reduction considerably larger than the weight itself, therefore achieving lift. In other words, Woodward's effect, if it is real, should be usable as an antigravity device or a space drive, in the sense that these terms are normally used in science fiction.

(3) Mass Reduction and Wormholes: Several previous AV columns have pointed out that negative mass seems to be required to stabilize wormholes (see my AV columns in *Analog* June '89, May '90, July '92 and Mid-Dec. '94) or to produce a "warp drive" of the kind described by Alcubierre (*Analog* Nov. '96). This raises the question of whether Woodward's effect could also be used to produce negative mass for this purpose.

For Woodward's apparatus, even if the *weight* were driven negative by the strong f^3 frequency dependence of the effect, the average mass of the capacitor bank would remain unchanged and its instantaneous mass, which depends only on the first power of f, would not be likely to go negative.

However, in the conclusion of his paper Woodward speculates on the possibility of producing negative mass, at least momentarily, that might be used to create and stabilize transversable wormholes. This might be done by raising the frequency and power level at which the capacitor bank (or its equivalent) is operated. It is not clear, however, whether with available materials it would be possible to achieve a negative mass, even momentarily, or if this would be sufficient to produce a transversable wormhole, since the negative mass

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condition would exist, at best, for a very brief time period.

In any case, Woodward's laboratory demonstration of Mach's Principle, if it can withstand closer scrutiny, is a very important new development in fundamental physics. Time will tell. . . .

The second recent antigravity "sighting" was an article in the *Sunday Telegraph* of London, September 1, 1996, describing "one of the most astonishing scientific developments of this century . . . the world's first antigravity device." It went on to relate how physicists at Tampere University of Technology in Finland, led by Dr. Eugene Podkletnov, had a paper accepted for publication in the prestigious *Journal of Physics-D: Applied Physics,* which described a new effect, gravitational shielding. The experimenters used a "high-T_c" superconducting disk cooled to liquid nitrogen temperature, levitated in a magnetic field, and spun up to a high rotation speed with auxiliary magnetic coils. It was claimed that objects suspended over the spinning superconducting disk were shielded from the effects of gravity and were reduced in weight.

However, there are already indications of problems with this work. After the article appeared, the editors of *Journal of Physics-D* informed a *Telegraph* reporter that the gravitational shielding paper had been withdrawn by its principal author on September 9 and would not be published in the foreseeable future. I note that a previous paper about the same shielding effect had been published in 1992, but I did not find the effect reported there convincing, since it could probably be explained by induced eddy currents.

AV Columns On-line: Electronic versions of more than eighty past "The Alternate View" columns by John G. Cramer are available on-line on World-WideWeb at the URL: http://www.npl.washington.edu/AV ■

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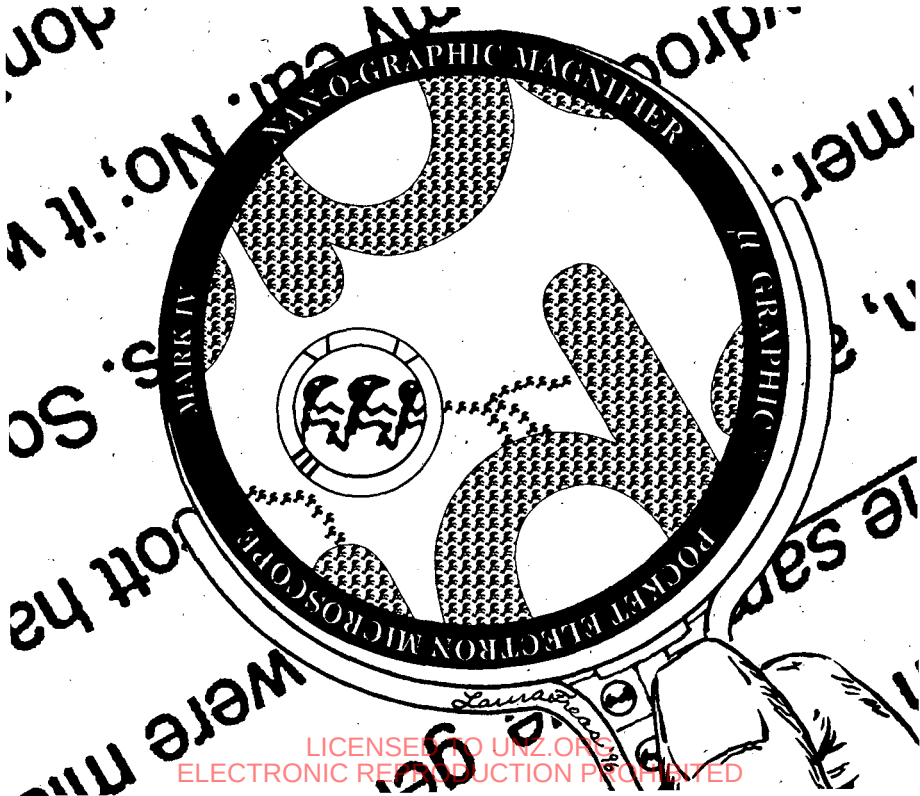
F. Gwynplaine MacIntyre

TEENY-TINY
TECHNO-TACTICS

Any resemblance between this story and the story in this story is purely coincidental—we hope!

Illustration by Laura Freas



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I could barely see my desk beneath the manuscripts. There were about three dozen universes sitting on my desk—universes that I had no desire to visit—and I had to pick one of them and put it into production. I sighed heavily, took another gulp of coffee, and started to hack my way through the slush pile.

I quickly rejected a universe inhabited by talking cats who went on a magical quest to find an enchanted scratching-post. I eliminated a universe occupied by flying unicorns and singing dragons; the unicorns flew and the dragons sang, but nobody *did* very much. I obliterated a water-planet inhabited by telepathic lesbian dolphins. I rather spitefully nixed a universe which (its author informed me in a portentous cover letter) was Book One of a forthcoming trilogy. The author had written only Book One of the saga, and it consisted entirely of plot setups and character developments that were intended to whet my appetite for the impending sequels. No such luck.

Next came a science fiction novel that wasn't really science fiction, but the author obviously *thought* it was science fiction because he had stuck the prefix "cyber-" on every noun in his novel. It was something about a cyberboy and his cyberdog who went on a cybertrip to . . . that's as far as I got. Then came a load of sword-and-sorcery drivel from an author who evidently thought that her prose would sound exotic if she transposed all her nouns and adjectives. The book was about a Sorceress Enchanted who went on a Quest Perilous to a Fortress Invincible to fight a Wizard Malevolent. I gave her a Slip Rejection.

My assistant readers, as usual, were no help at all. Tucked inside the cardboard box with every manuscript was a typed report by whichever one of my underlings had done the first read-through before kicking the manuscript upstairs to me. I didn't bother reading the reports; I knew from past experience that most of them boiled down to a four-page essay on the theme of "THIS STINKS."

Adding to my agony was the memo I'd received this morning from our VP of production. I was trapped in the publishing world's version of *"We don't want it good; we want it Tuesday."* One of the mass-market imprints in our glutcorp had missed a deadline. Our spring list was about to go to press with a gaping chest-wound where a new title should have been. The editorial board had decided to jump on *me* to pick up the slack for someone else's lapse. They made their position painfully clear: *we've got a business to run here; we ship product on schedule, and we meet that schedule even if the product is backwork.* The editorial board gave me a direct order: my division had to acquire a novel by 5 P.M. *today,* no backchat. Get it into production and get the author under contract by the end of the week.

Some other time, I would have jumped at the chance to make one extra editorial acquisition above my usual quota. But right now, none of the slush pile manuscripts in my inventory deserved to see the light of day. I took another look among the drivel: I would be genuinely *ashamed*

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to ship any of these novels into bookstores with my imprint's logo on the spine. I'd worked hard to build a top-quality imprint, and I didn't want to betray my readers by slipping a stinker into the midlist just to keep my bosses happy.

I took another gulp of coffee, just as Wendy came in to empty my OUT basket and refill my IN basket. The latest arrival was a 9-by-12 brown manila envelope, about an eighth of an inch thick. When I was editing short stories for the magazine markets, I got a lot of brown manila envelopes in the mail. Now that I'm a book editor, my mail comes in only two forms. I get legal-size windowpane envelopes for contracts and royalty statements, and I get humongous big cardboard boxes containing book-length manuscripts or the galley proofs from same. I seldom get anything else. But now here was a flat manila envelope on my desk. There couldn't possibly be a *novel* in there, but I recognized the logo on the return address label: Scott Richards was one of the best literary agents alive and out of jail at the moment, and he was also an old friend of mine. Anything that he saw fit to send me in a manila envelope was bound to be more interesting than the unagented junk that came over my transom.

I slit open the envelope eagerly, reached inside, and . . . *ouch!* Paper cuts are an occupational hazard for editors, and Scott's letter had sliced open my thumb. The blood wasn't much; I pressed my thumb against the paper napkin from my coffee cup as I tore open the manila envelope.

What the hell was *this?* Scott had sent me a one-page letter, handwritten under his letterhead. So why didn't he just fold it and stuff it into a legal-size envelope? For some reason, Scott had paper-clipped his letter to one of those white cardboard stiffener sheets that some people use when they want to send mailings out flat, so the edges don't get bent in the mail. The edge of the cardboard was what I'd cut my thumb on; I glanced at the cardboard accusingly, and. . . .

What the double hell was *this?* Somebody had actually *typed* on the sheet of cardboard; neat typewriting, double-spaced. I keep up with the new desktop hardware, but I don't know any brand of typewriter or printer that can output text on a piece of *cardboard* without curling it. Even a sheet-fed printer couldn't handle it. As I picked up the piece of cardboard, I turned it over and I saw more typing on the *back.*

That did it. Plenty of amateur authors who don't know any better will type their manuscripts on both sides of the paper, but what kind of idiot manages to type on both sides of a sheet of *cardboard?* And why was Scott Richards, who had a dozen best-selling authors on his client list, wasting his time (and mine) with cardboard amateurs? I would have chucked the thing into my dumpfile, unread, if it hadn't come from Scott's agency.

My thumb still tingled from the paper cut. I put the cardboard aside, and I picked up the cover sheet bearing Scott's familiar letterhead and handwriting. It was addressed to me:

Dear Sam: I enclose Nano Nanette,

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a brilliant new science fiction novel by Max Porlock, my agency's newest client. You've never heard of him, but he's got the goods. Let's do lunch some time. There was the usual sign-off, and that was all.

Something was wrong. Scott's note was obviously intended as a cover letter, to be sent out with the manuscript of a novel. One of his assistants must have clipped his letter to this cardboard thing instead, and mailed the cardboard to me by mistake. Whatever this sheet of cardboard was, it sure as hell couldn't be the manuscript of a complete novel . . . even though the author had typed on *both* sides of the cardboard. I picked it up and glanced idly at the first line:

NANO NANETTE. A novel by Max Porlock.

Oh, hell. This was a two-page *synopsis* of a novel, very unprofessionally presented. Did Scott Richards seriously expect me to offer a book contract to an unknown author, on the basis of a two-page synopsis? Typed on *cardboard?*

Just for a break in my routine, I picked up the sheet of cardboard in my right hand and started to read the typing on its upper surface.

It wasn't a synopsis after all. It was the *start* of a novel; the opening page. The author's narrative and dialogue were adequate. The typing was crisp and legible, without any errors. I read the first side of the sheet of cardboard effortlessly, then flipped it over with an easy clockwise motion of both hands and started reading the second page. The second page was better than the first; I got to the end, then flipped it over to read the third page. At the bottom of the third page, I flipped it over again to read the fourth page. . . .

Wait a minute!

I checked the folio in the upper-right-hand corner of the cardboard. Sure enough: it said page four. *But I was holding a sheet of cardboard that had only TWO sides!*

I flipped it over again, to the other side of the sheet, turning the page in both hands with the same clockwise motion. This time the folio in the top right-hand corner distinctly read page five. I turned it over again. Page *six.* And the typewritten words were different on each page.

On a hunch, I turned the cardboard over again with both hands. But this time I *reversed* my gesture, turning over page six counter-clockwise instead of clockwise. *Aha!* Sure enough, I had turned the manuscript back to page *five.* I turned it over again, same direction, and now I was back to page *four,* where I'd left off. I kept rotating the page, watching the folio in the corner as it counted downward from page three to page two to page one to . . . I flipped it over one more time. Now it claimed to be page 386. The text had changed again; this time it ended halfway down the page, and at the bottom of the page was typed THE END. Obviously I'd scrolled to the last page of the document.

I flipped the page again, reversing direction to go clockwise this time, and I found myself back on page one.

Somehow this fellow Max Porlock had stored the text of *an entire novel* on both sides of a single sheet of cardboard.

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That's one hell of a way to save on mailing costs.

I looked at the thing carefully, wondering if it was really some kind of high-tech display monitor disguised as a sheet of cardboard. No; it really did seem to be ordinary cardboard. Why was Porlock outputting his text on cardboard instead of paper? And more importantly: *how did he manage to store 386 pages of continuous scrolling text on a piece of cardboard in the first place?*

I went down the hall, borrowed a hand mirror from Wendy, and set it up on my desk. Now I picked up the manuscript of *Nano Nanette* again and held it up so that I was looking at page one. I glanced over the top of the page: in the mirror, I could see the backside of the document. Yes, it was page *two,* upside down and reflected into mirror-writing. I started reading page one again. Every few seconds, I glanced up from page one and looked into the mirror. Page two was sitting there quietly, waiting for me.

I got to the end of page one, and turned the sheet over to page two . . . but *this* time, as I turned the page over, I kept my eyes aimed squarely at the mirror.

Caught it! As soon as I turned the sheet over, so that page one became the backside . . . immediately, the words on the first page *dissolved.* I saw the letters ripple across the page, like swarming ants, separating and then realigning themselves in new configurations along the double-spaced lines. As soon as page two became uppermost, page one neatly changed itself into page *three.* The sheet of cardboard was rigged somehow, so that whichever side I *wasn't* reading would scroll forward or backward to become the next page after the one that I *was* reading. By using a mirror so that I could watch the front and back sides both at once, I caught the words while they were changing on the back page.

My thumb was itching where I'd given myself the paper cut. I put down the pixilated cardboard, picked up my phone, and punched the number for the Scott Richards Literary Agency. Not the switchboard; I called his unlisted personal cellphone.

"Scott Richards here."

"Sam Kurtz, at Augean Press," I said.

Scott chuckled that annoying little chuckle of his. "I gather you're calling me about *Nano Nanette.*" Here came the chuckle again. "Good plotline, isn't it?"

"Skip the plot; let's talk about the presentation," I told him. "Your client's whole novel is crammed into two sides of a page. How the hell did he *do* it?"

The chuckle again, and then Scott answered: "Max Porlock is not a full-time novelist. He's a biochemical engineer specializing in nanotechnology."

I edit a line of science fiction novels, but most so-called science fiction doesn't contain much real science, so I'm not always well-versed in tech-speak. "What's nanotechnology?" I asked.

"My client Porlock designs and builds *microbots,*" Scott told me. "Microscopic robots, each of them less than a micron in diameter."

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I vaguely remembered reading an article about something like this. "Shouldn't nanotech robots be called *nanobots?*" I asked Scott.

He made a sound that was the verbal equivalent of a shrug. "Nanobots, microbots, ittybittybots; call 'em whatever you want. Porlock makes microscopic robots, so I call them microbots. He programs them to perform multiple dedicated tasks in distinct logic states."

"Hold on a minute, Scott." I hunted around in my desk drawer, which contains a branch office of the Bermuda Triangle, and finally I found a magnifying glass. I picked up the sheet of cardboard and did the mirror trick again, but this time I was watching through the magnifying glass.

My hunch was right. Looking through the magnifying lens as I turned the page, it seemed as if I could see *each letter of the text* breaking up into thousands of tiny individual black pinpoints. They scurried across the page and rearranged themselves into new letters, sharply black against the white cardboard surface. I picked up the phone again. "Scott, are you saying that you mailed me a package containing thousands of *teensy-weensy robots?*"

He chuckled again. "*Millions* of robots would be more accurate, Sam. My client told me the precise number, but I didn't write it down. Clever, aren't they? The microbots are programmed to be phototropic."

I may be low-tech, but I'm not illiterate. "They respond to *light?*"

"Precisely. When you hold the sheet of cardboard, the microbots on the upper side—the page facing the light—will stand still and behave themselves. It's the ones underneath, on the dark side, who carry out their programming and convert to the next page of the text." Scott chuckled once more. "Those little buggers have the text of a complete novel downloaded into their programming in the form of a dot matrix, with a microbot assigned to each dot. Each individual microbot is programmed to occupy a specific position on page one, page two, page three. . . ."

I held the cardboard sheet within an inch of my eye. The black marks looked like ordinary typing; it was hard to believe that each letter was actually several thousand individual mechanisms. "You mean the letters on the page are little metal robots?" I asked Scott over the phone.

"Not *metal,* no." Across the phone link, I heard Scott ransacking the papers on his desk in search of something. "Max Porlock told me that his microbots are made of . . . what's this word here? *Alkanethiols.* Self-assembling hydrocarbon molecules. He tells me they're easy to mass-produce; they feed on protein chains to replicate themselves."

I picked up the cardboard again, starting to formulate a plan. "Why cardboard?" I asked Scott. "Why doesn't your client just output his text on paper?"

"Too risky," the agent told me. "The microbots eat proteins, remember? The first few prototype microbots kept eating the paper they were printed on. My client has developed a special acid-free cardboard made of

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chemically inert pulp. He says that the microbots think it tastes yucky."

"They *told* him this?"

"No, of course not. But the microbots don't *eat* it, so . . ." Suddenly Scott's voice shifted. Across the phone link, I could sense his body stiffening as he changed the subject: "Look, Sam, I've got a business to run here. I'm offering the first North American rights to Max Porlock's novel. You buying, or what?"

I had read the first four pages of *Nano Nanette,* and so far it hadn't grabbed me. Porlock's prose was clubfooted. His characters were made of the same thing as his manuscript: *cardboard.* What fascinated me about this novel was its *format.* I was starting to get big ideas about this microbot process. It could revolutionize the publishing industry, and I was the first one to see it.

My publishing house shells out plenty of money for shipping costs. And the unsold books take up warehouse space, which costs *more* money. Now I envisioned the future, a future with *no books at all.* Instead of printing thick paperback volumes, we could issue our novels on thin sheets of cardboard. A single nine-by-twelve rectangle would contain *the text of an entire novel.* Hell, why stop at novels? If Max Porlock could manufacture his microbots in a full spectrum of designer colors, our publishing firm could integrate them into illustrated cookbooks, art volumes, even children's pop-up books. I was sure that I could pitch this to the editorial board.

"Count me in, Scott," I told the agent. "I'll send you a contract for the licensing rights to your client's microbot process, and—"

"No deal, Sam." The chuckle was gone from Scott's voice. "My client was very specific about this. He refuses to sell or lease the rights to his nanotech hardware. He doesn't want to be known for his tech work; he has his heart set on being a best-selling novelist. I'm offering you a deal on Porlock's novel, and *that's all.* You interested?"

Frankly, no. Judging from the first four pages, *Nano Nanette* wasn't best-seller material. But Scott Richards had several top-flight authors in his stable—authors who should be sending their best work to *me*—and I didn't want to antagonize him. Tactfully, I said: "I haven't finished reading Porlock's novel yet, Scott. I'll get back to you."

"Great. Please understand, my client's microbots are designed to perform *multiple* functions. He refuses to sign any licensing deals that would confine his little brainchildren to a single industry, such as book production."

Scott hung up. Now I was back to square one: the production gang upstairs had made it clear to me that I had to acquire a novel, *any* novel, between now and five o'clock . . . or else my arse would be sparse. Maybe *Nano Nanette* wouldn't look so bad on my midlist after all. The cut on my thumb was tingling. I ignored it.

I picked up the cardboard, and started reading Porlock's novel from where I'd left off. Page five was pretty good, but . . . *aha!* A typo, at last. Halfway down page five, Porlock had left out the period at the end of a sen-

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tence. Well, at least it proved that Wonder Boy was human after all. I could forgive a few glitches; Max Porlock must have written an incredibly complex piece of software when he programmed all his microbots to spell out the dot-matrix text of his novel. As I read page five, I glanced into the mirror: on the backside of the cardboard, all the tiny microbots from page four were scurrying into new positions to become page six. *Places, everybody!*

I turned over the sheet of cardboard, and kept reading. *Aha!* Midway down page six, another period was missing. This fellow Porlock was beginning to slip. And his prose wasn't especially compelling, either.

I turned the sheet again. Page seven was waiting for me, right on schedule. I kept reading. Two-thirds of the way down the page, I found a typo that I'd never seen before. There was supposed to be a colon here, in the middle of a sentence. The upper dot of the colon was present and accounted for, but the lower dot had gone AWOL. Almost as if. . . .

Wait a minute. The bottom half of a colon is just a period. Ever since page five, a period's worth of microbots were missing from every page of Porlock's manuscript. Was there a glitch in the programming, or. . . .

I backflipped the sheet of cardboard, scrolling backwards to page one. The first page of Porlock's novel had been error-free the first time I read it. Now I started again.

Halfway down the page, a period was missing.

So it *wasn't* a glitch in the microbots' programming.

Some of the microbots had left the page.

I didn't want Scott Richards blaming me for losing his client's precious robots. I picked up Porlock's "manuscript," the sheet of cardboard, and started stuffing it back into the same manila envelope that it—

OW! Another paper cut. I looked at my right hand to see if it was bleeding.

A thin trickle of red was seeping out of the cut on my hand.

At the same time, a thin trickle of *black* was seeping *into* the cut on my hand.

I swatted the cut with my left hand. The trickle of microbots regrouped, and scurried back to their places on the manuscript. But some of the little buggers had slipped into the cut on my hand. I ought to . . .

No.

I took the manuscript out of the envelope. I had scrolled back to the first page, but now—as if anticipating my needs—the text had skipped ahead to where I'd left off on page seven.

Somehow the reading was effortless. My eyes scanned each line rapidly, unbidden by my mind. A couple of letters were missing. I knew where they were: their component microbots had slipped off the page, and they'd gone into business inside my bloodstream.

I was reading page eight. This time I didn't even need to turn the page; when my eyes reached the bottom line, the text *on the same page* gently rippled and shifted to become the text of the following page. Again, a couple of letters were missing.

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I was feeling steadily warmer. What was it that Scott had told me? The microbots were made from self-replicating hydrocarbon molecules. Some kind of . . . alkali? alkaloid?

Alkanethiols, whispered a voice in my ear. No; it wasn't inside my ear. It was inside my *head.* The alkanethiols feed on protein chains, don't they? *Yes, we do,* the voice assured me. Editors are not the world's healthiest people, but even we editors have a few proteins in our bloodstreams. By now, the microscopic robots in my bloodstream must be replicating quite merrily.

Aren't hydrocarbons poisonous, though? *Yes, we are,* said the voice inside my blood again. This time it sounded like a chorus of thousands. No, *millions* . . .

Quickly, I flung aside the cardboard containing the microbots. My right hand, unbidden, picked up the cardboard again. My left hand snatched it, and threw it out of my right hand's reach. . . .

Suddenly I discovered that I *knew* the entire text of Max Porlock's novel *Nano Nanette,* even though I'd read only the first eight pages. Something was altering my brain's neural pathways and memory cells, removing unimportant bits of information such as my address and my ATM number, and replacing these with vitally important data such as the complete 386-page text of Max Porlock's novel *Nano Nanette.* What a *terrible* book! The plot was mediocre. The characters were contrived. The dialogue was lifeless. Altogether, the book was . . . was . . .

It was the greatest novel ever written.

My right hand, without bothering to consult me, reached over and picked up the phone. My left hand managed to put up a faint struggle for a few seconds. Then, while my right hand held the phone, my left hand punched the appropriate number.

Scott had told me that Porlock's microbots were programmed to perform *multiple* tasks. I was starting to guess what those tasks were. Max Porlock could have made a fortune with his nanotech hardware, but he wanted to be a best-selling author. . . .

The phone was picked up on the third ring. "Scott?" I heard a voice inside my mouth say, as the microbots took over one more portion of my body. "Sam Kurtz here, at Augean Press. I'm going to fax you the contracts for Max Porlock's novel."

With that damned chuckle of his, Scott asked me: "So you like the book, then?"

I managed to speak, but by now the microbots were rearranging the furniture in my brain so rapidly that I had no way of knowing how much of my response was my own free will and how much of it was nanobot neurosurgery.

"Do I *like* the book?" I answered. "Let's just say that *I can't put it down.*" ■

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Probability Zero

Michael A. Burstein

HEISENBERG'S MAGAZINE

Things seemed a bit strange in the new offices of Dell Magazines. I always like to know what the place looks like where I send my stories, so I had arranged to have lunch with Stan Schmidt on the Tuesday after they moved to their new building next to Radio City Music Hall. I arrived a little early, and told the receptionist that I was here to see anyone from *Analog,* just in case Stan wasn't in yet.

"Hold on," she said, punching an extension on the phone. The reception area felt empty, even with the cardboard boxes everywhere. I think it was the relatively small pile of mail on the receptionist's desk that made it seem so empty.

In a minute, the entire editorial staff of *Analog* ran down the hall to greet me. The exotic Tina Lee, the smiling Scott Towner, the beauteous Sharah Thomas—everyone except Stan. Tina had galleys for me, and Scott proudly handed me a box filled with copies of the July 1995 issue I had ordered.

"Thanks, guys." I looked down at all the stuff they had handed me, and when I looked up, Tina and Scott had already gone. That was fast, I thought. Sharah still waited for me.

I reached into my book bag and surreptitiously handed Sharah a submission for *Asimov's,* so Stan wouldn't know about it. We hugged in greeting; Sharah and I had become good friends since we first met at the Nebulas in 1995 and discovered that we had attended Harvard together and lived in the same dorms.

"I'm sorry to interrupt you guys as you're settling in," I said to her as she led me to their cubicles.

A smile lit up her face. "Think nothing of it. I would stop the world just to get a phone call from you."

We arrived at the cubicles. Sharah said good-bye and disappeared behind a partition.

Stan was on the telephone, looking none the worse for wear despite the

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bump on the head I gave him with a Hugo rocket back in the "Probability Zero" section of the October 1995 issue. (Look it up, I'll wait.) As always, his eyes twinkled with delight when he saw me. He was even more pleased to see me than ever before, and I wasn't sure why. Maybe it had something to do with the Analytical Laboratory Award, the Hugo nomination, or the Campbell nomination.

He hung up the phone and said, "Michael! Are you ready? I want to try a new restaurant today, Argentine Pavillion. New to me, I mean; I've never eaten there, but I've seen it before."

"OK by me. Know where it is?"

"Yep. I've been by it a dozen times. Let's go." I dropped my stuff in his office cubicle, and we headed out onto Sixth Avenue. I followed Stan to 46th Street, and we walked up and down it twice. All the while Stan kept looking around.

Finally, we stopped in front of an abandoned storefront. "It's not here," he said.

"What do you mean?"

"I could have sworn this was it."

I thought for a moment. "Well, we have two choices. We can go back to the offices and look it up, or we can call Information on a pay phone."

"Good idea. I saw a few pay phones on the corner. Let's go."

We got to the corner, and there were no pay phones. Stan scratched his head, puzzled. Then he laughed.

"This is familiar," he said.

"Restaurants and phones disappearing is familiar?" I asked, incredulously.

"Well, the disappearing part, I mean. Because of the move, a lot of stuff seems to have been misplaced. Boxes of issues that I thought were in one place turn out to be somewhere else. Even the papers I put on my desk this morning vanished."

"That doesn't sound good," I said, thinking of my contracts and checks.

"Oh, it does have its good points. All the slush manuscripts from unknown writers disappeared, as well as all the *Asimov's* Hugos." He grinned.

"Maybe it's a quantum phenomenon," I suggested. "Heisenberg's Uncertainty Principle, and all that. Perhaps there's a wave of uncertainty passing through the magazines, even as we speak, making changes left and right."

"Hm," Stan said, a gleam in his eye. "You might want to make a 'Probability Zero' out of that."

I was stunned; I had just been making a joke. "You want *another* recursive story about *Analog?*" I asked. "Well, if you're willing to publish it, I'm willing to write it." Then a thought struck me. "Hey, it'll give me a chance to work Sharah into a story. She's been bugging me to do so, ever since she realized that Ian and Scott were in the last one."

He nodded. "You'd better not mention that in print, though, or a lot of people will bug you to put them into stories. Especially Tony Lewis; he loves to keep track of recursive science fiction stories, and would probably ask to be mentioned in one. In the meantime, let's head back to the offices, before they disappear entirely." We laughed.

Stan had taken only one step when I spotted a pay phone on our corner.

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"Stan! Look!"

He did, and frowned. "I would have sworn this wasn't here a moment ago," he said, as I called Information and found the restaurant. The address they gave was for the abandoned storefront, and when we got there, it was no longer the abandoned storefront, but the restaurant Argentine Pavillion.

We didn't question it; maybe there *was* a wave of uncertainty passing through our lives at the moment. After all, the fate of the digests had seemed uncertain for quite some time; these were probably residual quantum effects we were experiencing.

We entered the restaurant and sat down to order lunch. Stan began raving about my stories, and all the ideas he had for my career. He finished by saying, "Michael, as long as I am editor of *Analog*, your stories will always have a market. We're going to make you a star!"

I blushed and looked down at the table. I still felt a little uncertain about the suddenness of all my success. But I also felt grateful that Stan Schmidt had shown such faith in me as a writer.

Then I looked up. "Stan? Stan!" I shouted, but he had already disappeared. ■

To lend someone a hand when they've fallen and really can't get up, or move without assistance, is one thing. To have them demand a piggyback ride from you when they are perfectly capable of getting up and walking on their own, is quite another.

—Henry G. Stratmann

If you leap into a well, Providence is not bound to fetch you out.

—Thomas Fuller

It requires a very unusual mind to make an analysis of the obvious.

—Alfred North Whitehead

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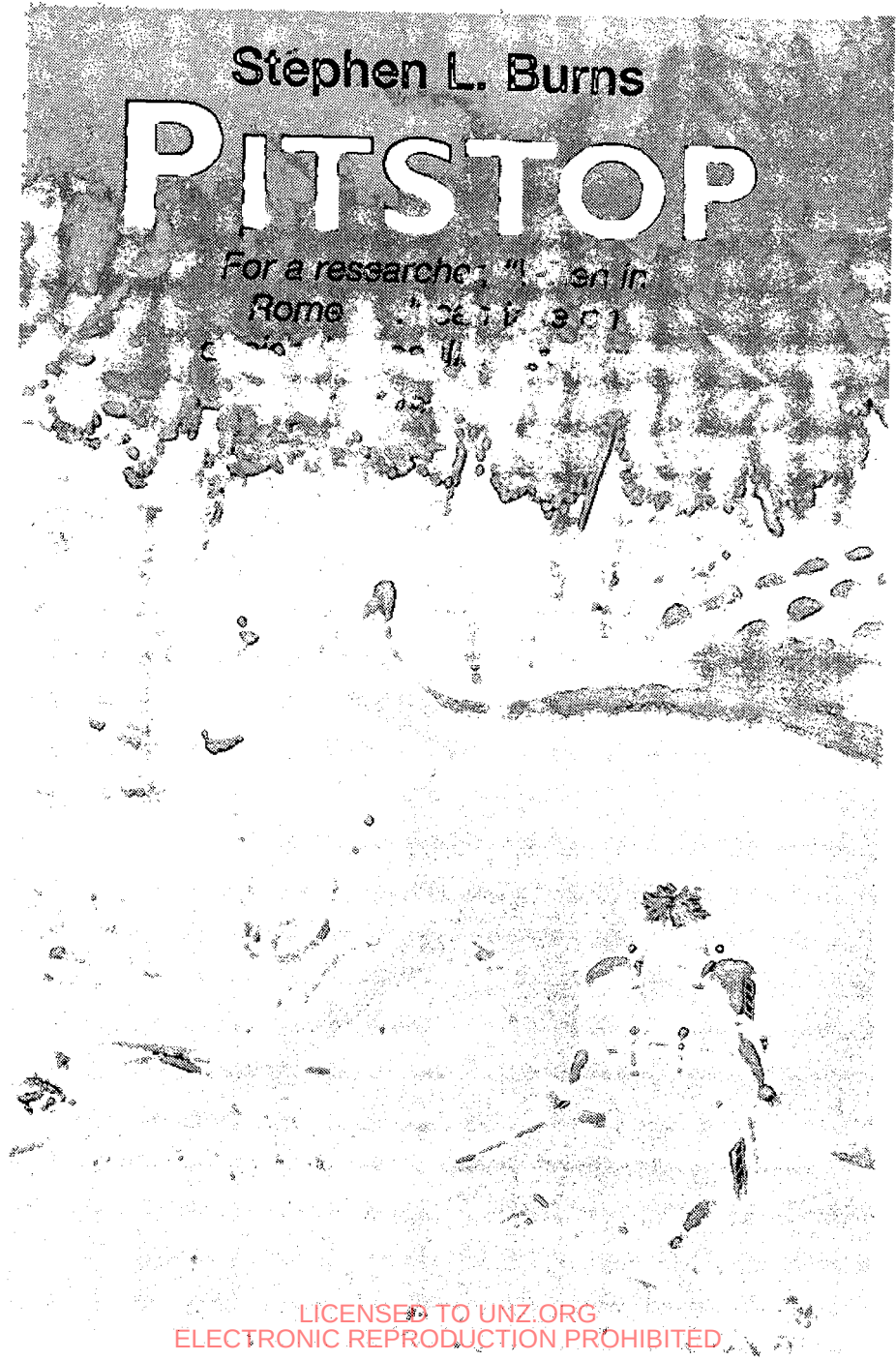

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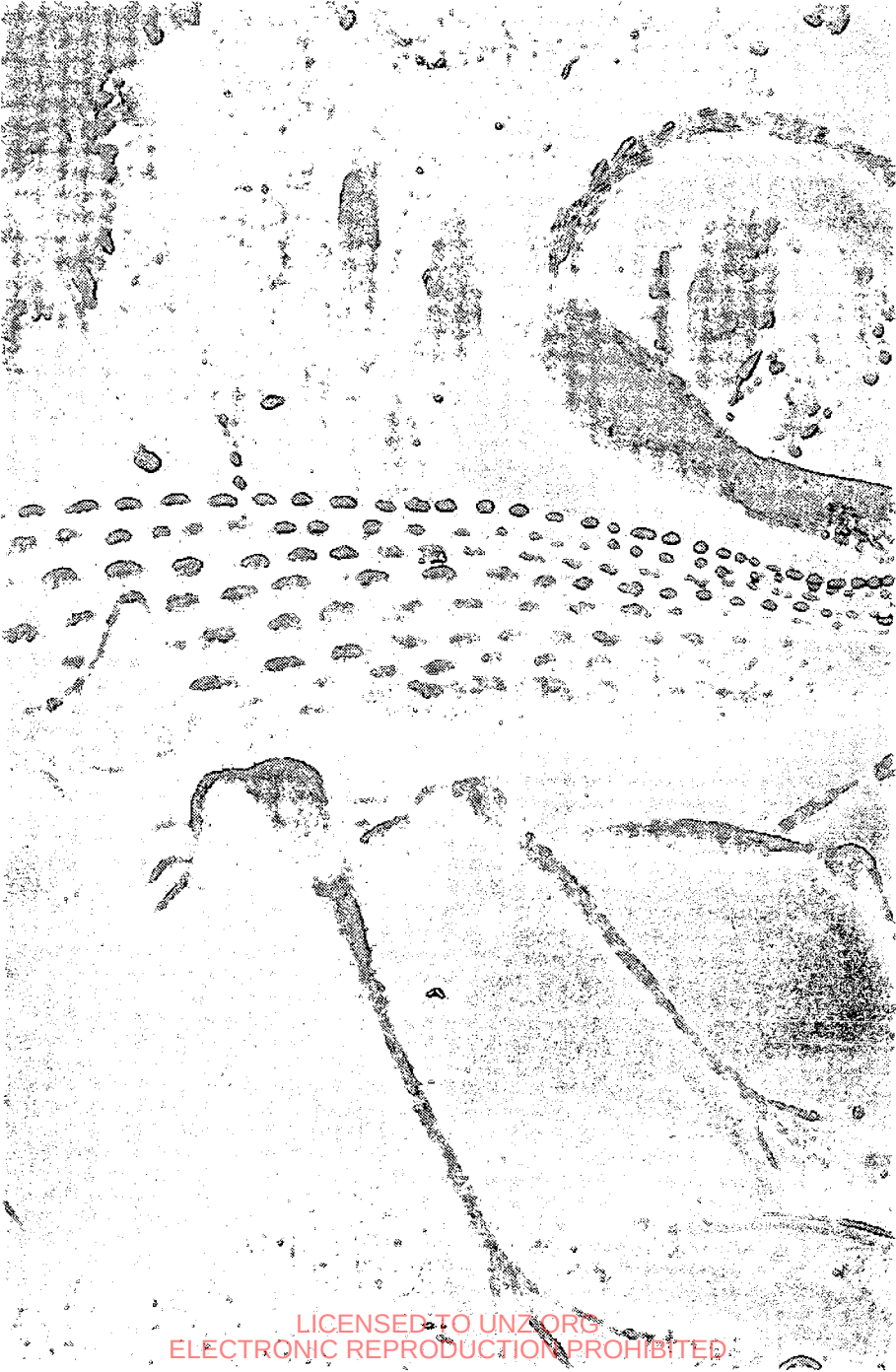

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Their marriage was widely believed to be one of convenience, the contract renewable on a year-to-year basis. Every year they surprised their colleagues by signing on for another stint.

"Dammit, will you take it easy, Claire! You spilled my bloody coffee!"

Claire Alvarez-Linstrom turned her head and grinned at her husband from the blindship's piloting station, a console and chair bolted to the blue shag carpeted floor near the bay window. "We're making a planetfall, Arthur dear, not doing brunch. You should expect a little turbulence."

As if to back up her assertion, the craft shied violently. The gravdampers could have compensated, but she insisted on leaving them on at the bare minimum needed to keep the place from coming apart at the seams. *Can't fly by the seat of your pants when you've got your butt parked on a pile of fluffy cushions,* she always said. That did give her more feedback, but then again she was one of the few surviving practitioners of the inexplicable fad sport of broken-cord bungee jumping.

Professor Arthur Linstrom tried to make himself ignore the look on his wife's face. In repose her wide coffee-and-cream features, shaped by her unknown part-Latino parentage, could show a timeless and demure beauty that took his breath away. But other times, like now, one look into her dark eyes and words like *pure stone crazy* sprang to mind, and bladder control became the issue. He reminded himself that no matter how many times her driving had scared him to death, she hadn't killed them yet. *Yet* being the operative word.

"If the air is that rough," he replied with a poor imitation of patient tolerance, "Then swop over to auto. This trip doesn't have to be a blasted roller coaster ride."

She gave him a look like he'd just suggested that they get out and walk. "This is quite possibly a rescue mission, remember? Which means we're in a hurry. Auto's just too slow and cautious."

"For you, maybe," he grumbled half under his breath as he swiveled his chair back toward the science station's main board. Groping blindly behind him he snagged whatever it was draped over the back of his chair to use for mopping up the spilled coffee. A mean-spirited grin appeared on his long Nordic face when he realized it was her sweatshirt. *Serves her right,* he thought as he blotted up the puddle.

"Besides, I need to practice my piloting," Claire continued blithely as the craft suddenly plummeted at least two hundred meters in less than four seconds. "*Yaboo!*" she cried, wrenching on the yoke and executing a maneuver which might have made a kamikaze break toilet training.

"You think I haven't noticed?" Arthur moaned as he tried to peel his stomach back off his tonsils and empty his mind of thoughts of what hitting the unforgiving ground below at just over Mach 2 would be like. Theoretically the sfhere, the bubble-shaped stasis field wrapped around their craft, would protect them. He remembered the time back on Glacia IV

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when she had broken up the ice jam which had flooded an ancient city by playing human cannonball, ramming into the keystone berg at somewhere in the neighborhood of 500 kph—her only warning a somewhat inadequate and rather gratuitous *Hang on!* He still got the shivers thinking about it.

The only ice on the planet below was a thin frosting at its polar caps. Given the working name of Pitstop, it was fourth from the sun in a system of fourteen planets and sixty-one moons. A small, dense, metal-rich world, its surface bore a vague resemblance to the caps of the morel mushrooms he'd picked as a boy in southern Ontario: high, barren and nearly airless rock ridges separating deep, roughly conical valleys—the pits which had inspired its name. Planetologists and geologists were scheduled to begin studying how it got that way sometime next week.

However it had formed, there was enough atmosphere and water to support even human life at the bottom of these pits, and a somewhat limited but quite robust variety of life abounded in a broad band of them circling the planet at its equatorial temperate zone, each pit an apparently self-contained ecosystem. A sentient species inhabited this niche, one of the three the Expedition had found in the system, and the most primitive.

There were almost four hundred people on this Expedition, and so far only one professor studying Pitstop—partly because the initial survey had pegged it on the ho-hum side when compared to some of the other places, and partly because no one would work with the aforementioned and legendarily disagreeable professor.

A professor who now seemed to be missing.

"Any sign of old Whaletits?" Claire called, pushing her dark hair out of her eyes and squinting out the bay window as if looking for someone to dogfight.

"No. I'm reading indigenes and the usual flora and fauna in each pit we pass over, but no sign of Professor Whalsitz."

"Well, be sure to sing out *Thar she blows!* if you spot her! Otherwise we'll just continue on down to where her blindship is parked and start from there."

Getting out of the sky and onto solid ground sounded like an exceptionally good idea to Arthur. "How long until we get there?"

"Splashdown in five minutes."

His broad forehead furrowed in a warning scowl. "Will you stop calling it that, Claire! We are going to alight, gently as a settling thistledown. Right? *Right?*"

She snickered. "Whatever you say, my rooster."

The craft suddenly sideslipped and began plunging downward. Arthur's cup went skidding across the board and off the edge, tumbling to the shag-carpeted floor.

"That's it, we're getting a divorce on our next anniversary," he growled darkly as he tightened the straps of his crash harness. On the biggest science station screen before him a jagged rocky scarp flashed beneath them with what appeared to be only a whisker to spare and they began de-

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scending into the pit.

Their landing was not, as Arthur had feared, a reenactment of Dorothy's famous filmic house-drop into Oz. This was an especially apt image considering their craft's appearance.

Much as he hated to, he had to give Claire credit. When she wanted to, she could settle a blindship in with as close to zero disturbance as could be expected from landing what was essentially a two-bedroom, one-bath, single-story modular house wrapped in a Whugg sfhere. When she wanted to. Today she did. Next time, who knew?

"We're down," she announced, a faint vibration passing through the building as it settled in. "Welcome to Pitstop." She punched in a command for automatic shutdown, stood and stretched her tall, chunky body. "How're we looking?"

"Seriously not here." The spytes had deployed while they were descending, and, site integration complete, four had arrayed themselves to relay a blindage check. Claire sauntered over to stand behind her husband and look over his shoulder at the display.

Seen from the outside their ungainly vinyl-sided craft was effectively invisible. The spytes had scanned the landing site down to the micron level. Now a virtual copy of the unoccupied site was being projected by holocloak, the ship's Whugg computer constantly adjusting the image to compensate for changing light levels, wind and other environmental factors. Nor was the visible light spectrum the only band covered. Any creature that used radar, sonar, charge-sense, magnetic imaging or other perceptive method would likewise be fooled. Like most Whugg technology, humans had only the vaguest idea how the damned stuff worked and even less compunction about using it.

Still, placement of a blindship was critical. Invisible or not, if you parked it dead square across the alien equivalent of a footpath an indigene was bound to walk right into the repeller field, thumping its alien equivalent of a head and going *What the hell was that?*—or the alien equivalent thereof. Although the incommunicado and quite possibly missing Professor Maud Whalsitz was an exothropologist and ostensibly studying the indigenes, she had parked her blindship at the edge of a clearing well over a kilometer away from their sprawling village. Claire had put their brown-roofed craft down among some bushes and trees directly across the bare red ground from the other vessel.

"Looks good," she agreed. "Well, Cap'n Ahab, you ready to go after the great white Moby Maud?"

"You better knock that off," Arthur warned as he shrugged off the harness and stood up. "She's a Protected Lifestyle Minority."

Side by side they looked to be very nearly the same height, but dressed for different purposes and destinations. His short gray hair and official Expedition uniform of a conservatively cut brown jumpsuit, complete with military specification pen pocket and multipocketed black vest, was neatly starched and pressed; it made him

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look like a professor of SWAT Science. She, on the other hand, wore a low-cut purple silk blouse, faded patched jeans, and battered cowboy boots. She did wear the official vest, but hers was covered with a collection of buttons, pins, and gag medals.

She put on a look of mock chastisement. "Sorry pod-ner. I can't cetacean cheap shots if they're only going to make you blubber."

He gave her a pained look, then shook his head ruefully. "Why did I ever let you marry us?" They started toward the front door of the house, which acted as an airlock.

"Tax purposes?" she suggested.

"*You're* taxing, and there seems to be no rebate in sight. I wish I knew how I managed to overlook all the proof that insanity runs in your family."

"I'm an orphan, remember?"

"Uh-huh. There are times I think you also want to be a divorcee."

She slipped an arm around his waist and squeezed. "You'd miss me if I was gone, Mr. Science."

"You're darn lucky I'm not an experimentalist."

Arthur and Claire had been married for four years. Their jobs had initially thrust them together, many of their colleagues wondered what kept them together, and their union could be regarded as just one more largely inexplicable Whugg artifact.

The institution they were part of was also based on a marriage of convenience, namely the odd partnership between Humans and Whuggs.

The two races were little alike. Whuggs were smart. So smart that expecting humans to gauge their intelligence was rather like asking squirrels to administer and interpret an IQ test for a Hawking or Einstein. Moreover, Whuggs were insatiably curious; their fundamental urge was to *know more.* An old Earth aphorism stated that, "As grows the circle of light, so grows the circle of darkness." Whuggs knew that one, and it drove them *crazy.*

The great Whugg character flaw was their absolute and unwavering refusal to travel—or even budge from the spot where they were acroamatriculated. Since they were one of the very few non-plant biologic entities with taproots, this was hardly surprising. The Whuggan fear of uprooting makes the human fear of death look like the mildest anxiety over a developing zit. Factor in the fact that adult Whuggs are the size of shopping malls—parking included—and you had a bunch of serious homebodies on your hands.

Whuggs were plenty smart enough to acknowledge their own shortcomings and seek a rational way around them—something many considered to be their most inhuman quality. A concerted effort of enough sheer brainpower to beat God at Scrabble allowed them to create a modest transient hitch in the space/time continuum's gitalong which they used as a probe to seek out a race to act as the questing organs of their curiosity.

Humanity, whatever its other shortcomings, was not Hobson's choice in this selection process. Life is three notches past ubiquitous in the Universe. Come to find out the trick was not creating life, but keeping the

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damn squirmy stuff from infesting and messing up every nice clean and tidy planet and moon capable of supporting it.

Several candidates were considered and rejected before the Whuggs snuck a cautious look at Earth. There they found a reasonably bright race that routinely produced creatures perfectly willing to pack their bags and go knocking about various star systems, sticking their noses into things for the pure hell of it. They even had a literature of sorts dedicated to that proposition, even though they hadn't been back to their own Moon in almost fifty years. While it was true that they had several nasty habits and quite unpleasant tendencies, in their favor was the fact that humans were nearly as curious as the Whuggs themselves.

Contact was initiated, first through the hitch, then more widely and easily through the Whuggs's organoform and omnipresent version of the computer. Negotiations went well, and the Whuggs soon found themselves experiencing the warm pleasure a dog owner feels when he gives his pet a new squeaky toy upon mentioning that their new space buddies would of course be shown how to build such primitive but useful devices as matter transmitters and transmuters, time-to-energy converters, zero-loss recyclers, reactionless and faster-than-light drives, stasis-field generators, and gravity twisters.

Sound like a good deal? the Whuggs asked hopefully. For all their intelligence they were rank innocents in the bargaining business; the kind that would have paid full retail *and* taken the service contract.

You bet! humans answered, knowing a damn good deal when they heard one.

Of course there were adjustments to be made. Humans had to get over a few preconceptions before they embarked on this great adventure. For instance, no great gleaming spaceships were to be constructed for the purpose of exploration; Whuggs found that idea utterly adorable but wholly impractical. They were into, as an old hot-rodders' phrase put it, *Run what you brung.*

Although those riding on it called the huge craft which had carried their expedition to this star system a mothership, it was actually the former Danforth Quayle Preparatory School, golf course and squash courts included, sfhered up and turned into an interstellar craft capable of running .35 light-year per hour flat out with no inconvenient time dilation to wreck everybody's schedules. The over sixty smaller exploratory craft it carried along were a motley assortment of cheesy modular homes, house-trailers, RVs, and a decommissioned diesel submarine, all sfhere-shielded, gravity-fueled, and capable of about a quarter AU per hour.

The bureaucratic and diplomatic name for this venture was the Whugg/Humanity Noemic Traveling University. But the ten thousand-odd scientists and researchers from a hundred different disciplines and institutions who became part of it mostly used the nickname bestowed by one of its founders: *Why Not U.*

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So, for that matter, did the Whuggs.

"Any major life forms nearby?" Claire asked, the moderately aggressive way she was carrying her stun rifle suggesting that she hoped the answer was yes.

"Not at the moment." He glanced back over his shoulder, eyeing her weapon mistrustfully. "Is that thing on safety?"

She looked hurt. "Have I ever accidentally shot you before?"

"No, but there was that time you shot me on purpose. Once was plenty, thank you very much."

"Shooting you saved your tenured buns, remember? That swamp-dwelling whatchamacallit—"

"Derosian bogmaster," he supplied, wiping the sweat from his forehead with his handkerchief. The Pitstop lowlands were every bit as hot and steamy as Earth's tropics. He glanced up at the small hot sun, wondering if he should have worn a hat. Five minutes was all it took to turn his fair skin the color of a boiled lobster.

"Right. That ugly puppy would've had you for lunch if I hadn't popped you to convince it you were dead. We were lucky it was a picky eater."

"I *was* dead! All electrical and chemical activity stopped cold." He shuddered at the memory. That unhappy event had occurred on their first Expedition together, back before they were married. On one side a creature that made a Lovecraftian horror look like a Disney bunny, on the other this aggravating crazy woman squinting through her gun sight as she drew a bead on him. Then nothing, not knowing until he'd come to which had gotten him. That image of himself as a sitting duck had recurred frequently the day they got married, and he still occasionally wondered if he might just have been better off with the bogmaster.

She quickened her pace to give him a fond pat on the fanny. "Coming back to life made you horny as hell, if I recall. That's when we started fooling around. Remember? We had hot zombie nookie for two solid days."

"And I needed a week to recover afterward. Careful, watch your step!" They detoured around a loveseat-sized heap of fresh dung that was a faded hue of the vivid lavender that was the predominant color of Pitstop's vegetation, a scattering of what looked like glitter embedded in it.

"That's one titanic turd," Claire snickered.

"Indeed. It must have come from one of the big animals Maud called *leviathans*." He pointed to several others in the clearing. "It would appear that they come here fairly often."

"So Maud parked on the rim of a toilet bowl. Do you think she was studying them?"

"Maybe." His handpad wheeped. He looked down at the screen, paled. "Uh oh, that's one coming into sensor range now. We better hustle. They're supposed to be vegetarians, but there's no sense taking chances."

Claire surveyed the surrounding growth with bright-eyed anticipation. "Don't worry, old Betsy and me will take care of it."

"It's almost suppertime, not high noon." He spoke into the pad. "Blind-

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ship Echo Seven, drop portal cloaking and open."

Twenty meters in front of them and two off the ground a section of Pitstop's lean-limbed, jelly-leafed jungle vanished, replaced by the welcoming arch of a blindship portal—which in this case was a fanlighted faux-wood front door complete with brass knocker and mail slot. The long metal tongue of its boarding ramp extruded down toward them.

Arthur started walking faster, one eye glued to the red dot which marked the leviathan. "Come on, lady! Let's get inside and buttoned up in case it comes here."

She increased her pace only slightly, her lower lip quivering in a theatrical pout. "You never let me have any fun!"

"I'm your husband," he shot back, as if that explained everything.

Claire was, of course, more than just another gun nut.

Her official title was Expedition Fixer, a term the Whuggs found so splendidly evocative that they had insisted on its use. The supersentient aliens were not micromanagers. The human contingent of Why Not U chose who went on Expedition, and the Science Master decided what they did there.

The one exception to this tentacles-off policy was the office of Fixer. That person was always chosen by a Whugg or Whuggs. There was some confusion on this point; sometimes several spoke as one, other times one spoke as several, and the rest of the time were just in their everyday state of multiplex discrete consensual singularity.

Equal in rank to the captain of the huge mothership the Expedition had come in and was based from, as Fixer Claire was partly morale watchdog—acting as counselor, confessor, therapist and spat resolver; and partly head of security—functioning as cop, criminal investigator, judge and jailer. She could perform weddings, divorces, and autopsies with equal gusto. Part constable, part shrink, and part sacred clown, it was her job to act as the grease which kept all the odd human cogs from grinding each other toothless. She had more degrees than her husband, and acted as if they had all been gotten through mail order by sending in box tops.

Although there was nothing hurried, or even particularly coplike about the way she moved, it took her only a couple of minutes to ascertain that Maud Whalsitz was not on board and there were no immediate signs of foul play.

"Can you believe this pigsty?" Arthur called when she returned to the living room that served as main compartment. He stood in the middle of the floor, unhappily surveying the scattered food containers and wrappers, empty beer and liquor bottles, mounds of funky laundry and other uncategorizable detritus that covered every available surface. All in all it looked like a very large wild animal with an unrestrained fondness for junk food had been holed up in there.

"Yeah, I've seen her digs back at home base." Claire picked up a box at her feet, sniffed it and frowned. "Hmmmmm."

"What have you got there?" Arthur asked, hoping it was a clue. The soon-

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er they wrapped this up the sooner they could go back to their own blindship, which was, thanks to him and no thanks to her, neat as a pin.

"Dried salted herrings." She extracted one by the tail, held it out toward him. "Want one?"

"You're joking," he answered, revolted.

"Had to after I smelt it." She dropped the small fish back into the box and put it aside. "Are the ship's systems still monitoring and recording the area outside?"

"I'll check." He picked a path to the science station and, wishing he'd brought rubber gloves, fussily cleared the dreck off the console and chair. Wiping his hands on his pants he sat down and began a status check.

"It's on. Is there something I should be looking for?"

Claire was holding a food-stained puce nightgown out in front of her, sizing it against herself. Although not a small woman, there was room enough for four of her to ballroom dance and even practice synchronized dipping inside it. "Hippo tracks?"

"What?"

She grinned at her husband, wadding up the garment and tossing it away. "All right, class, here's today's lesson in deduction. The missing Professor Whalsitz is not anywhere on her ship. Therefore she must be, stay with me now, *elsewhere*. I believe we can logically assume that she went outside as her first step in disappearing. So what we do is backtrack through the recordings until she was last sighted. Knowing what she was doing when last in the area may tell us where she went."

Arthur nodded. "Good thinking."

A modest shrug. "Us law enforcement types know more than just our donuts. Though some cruller sorts refuse to admit it."

He sighed. "I'll pretend I didn't hear that." He turned back toward the console. "System. Locate and replay last sighting of Professor Whalsitz in the area outside."

"Entire recording?" the device replied. "It runs thirteen minutes and twelve seconds."

Arthur turned back toward his wife to see what she wanted him to do.

"Why not?" she asked, sauntering toward him with a big plastic bag tucked under one arm. "I've got the cheese popcorn."

Dr. Arthur Linstrom hated it when things went wrong. Had he been the sort given to tattoos—which he wasn't—his might have read *Born to Count Beans* or *Death Before Ducks out of Row.*

Expeditions existed to collect information to be shared with the Whuggs. To his orderly mind that process had to be carried out as smoothly and efficiently as humanly possible. Humanly was the key word. Since the normal state of human affairs is the sort of milling muddled confusion you might expect from a flock of neurotic, tone-deaf sheep attempting to square dance, achieving such a lofty goal took no small amount of doing. There were nearly four hundred people on the Expedition working this star system, two-

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thirds of them scientists from several dozen disparate disciplines. The only surer recipe for conflict would have been to involve either religion or soccer.

He looked upon this group as an orchestra: one where each chair was playing a different instrument, interpreting the score on their own terms, quite often seeing themselves as soloists, and ignoring or trying to drown out the other players whenever possible.

His title was Science Master, but he saw himself as conductor, and his mission as coaxing a sweet symphony from what all too often lapsed into atonal noise. Assignments, equipment and resource disposition, scheduling, information exchange, data review, and acting as methodology watchdog were all within his purview.

Having one member of the Expedition come up missing was bad enough. That the missing member was one he would gladly have done without in the first place was enough to put his most recent round of ulcer treatments to the acid test.

Professor Maud Whalsitz. "Old Whaletits" behind her back to one and all, thanks in part to her Hindenburgesque bosom.

Maud was not one of the best minds Earth had produced. She had managed to bully and backstab her way onto the periphery of the team of scientists who had worked with the Whuggs to create Why Not U, through vile force of personality mutated that into Full Tenure, and pretty much coasted since then. Her research was sloppy, her record-keeping haphazard, her conclusions ill-founded and generally wrongheaded. Although ostensibly an exothropologist, what little work she did produce fairly bristled with contempt for alien races. Anytime Arthur learned that she had finagled a berth on one of his Expeditions he immediately categorized her as Excess Baggage.

A hack like her would have been tolerable were she just another doddering, mossbacked chair-warmer dozing toward retirement. But the sewage ripple ice cream topping on the toxic waste cake was Maud being a Pyg.

Pygs—followers of the late and largely unlamented Alexi "The Human Landfill" Pyg—literally lived to throw their weight around, fanatically following a perverse self-help regimen constructed around a variation on a very old joke: *Where does an 800-pound gorilla sit?*

The answer was, of course, *Anywhere she wants!* Pygs used a variety of means to become as grossly huge as humanly possible. Not huge like your Aunt Flo whose weakness for Sara Lee has kept her from seeing her toes for the past ten years, but huge as in big enough to give the owner of a freak show nightmares. A dedicated Pyg made a sumo wrestler look like a slat-ribbed anorexic. Within the Pyg community a member who tipped the scales at a mere seven hundred pounds was suspected of backsliding.

The logic behind this flabulous form of body modification was to have more weight to throw around than anyone else, and keep what you had glommed by becoming an im-

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movable object. But that was only one cracked facet of Pygism. They also cultivated a calculated slovenliness, and the sort of obnoxiousness of habit and personality guaranteed to make everyone around them adopt a hands-off policy.

The reason Maud got a seat—several seats, actually—on any Expedition she wanted to join was because nobody at University Central back on Earth wanted her around, and they kept hoping that one of these times she might not come back.

It was beginning to look like this time they might just get their wish.

"There she is," Arthur said, as if there were any way Claire could miss her. On the screen before them what looked like an overinflated parade balloon with orange hair and green teeth waddled into view, her rolling jostling territories sheathed in enough lime green stretch fabric to Christo a minivan. Only the Whugg gravtwister bracelet on one hamlike wrist allowed her to move under her own power.

"When was this?" Claire asked from behind Arthur's shoulder.

He peered at the datatrack on the bottom of the screen. "Yesterday afternoon, around two."

"Then she's been gone for over twenty-four hours. Still, you wouldn't think she could have gone too far away."

"It's doubtful. I've never seen her walk more than twenty steps without bitching about it."

The big woman lumbered toward a tree-like growth with a triple helical trunk and blobby lavender leaves. A scowl appearing on the jowly porcine puddle of her face, she lowered herself to her knees.

"What do you think? Her daily exercise routine or prayer?" Claire asked with a chuckle.

"No, she's—" He leaned closer to the screen. "She's digging."

"So she is. What kind of tree is that?"

He shook his head. "Couldn't say. Maud had been sending me squat back at the mothership. Some stills and half-assed descriptions. That's how I found out she was out of contact. I was trying to tell her to get the lead out."

Whalsitz unearthed a breadloaf-sized black pod or nodule from the reddish ground. Tucking it under one arm she fiddled with her wristlet and levitated straight up, unfolded her legs and settled back onto her loafered feet like a spacecraft carved from moldy suet.

She went back to the center of the clearing, wrapped her sausage fingers around the bundle of fibers at one end of the pod and pulled. The pod opened lengthways, iridescent aqua bubbles foaming out of the opening. The bubbles swelled and popped, and the big woman wrinkled her flat nose in distaste. Her mouth began moving.

"Would you please dial up the sound?" Claire asked.

"Sure." He leaned forward and tapped a pad.

"*—Strom's jockstrap,*" Whalsitz rumbled. She sneezed violently, wiped her nose on her sleeve, then

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stared expectantly around her.

"Any idea what she's doing, Claire?"

She shook her head. "The experts are baffled."

Several minutes passed, Maud clearly growing impatient with waiting. Then they heard a faint and far-off new sound which had been captured on the recording, a distant subterranean rumble. Whalsitz's head turned and she peered off in that direction, her piggy eyes narrowing to slits.

"According to sensor readings that was a leviathan approaching the area," Arthur murmured tightly. The rumble continued to grow louder, like an oncoming avalanche.

"Sounds bigger than a breadbox."

"Bigger than an elephant. According to what little data Maud did send, at adult stage leviathans are about eleven meters long and eat over half a ton of vegetation a day."

"Sounds like my old seafood diet. It sees food, it eats it. The thing's still coming toward her."

He nodded. "Two hundred meters and closing."

"Whaletits isn't running away."

Arthur let out an uneasy laugh. "Do you think she even *could?*"

Claire leaned over his shoulder and toggled a wider view.

"Well," she chuckled as she straightened up, "If the old blob had any run in her, seeing that thing coming should have brought it out big time."

The leviathan was big enough and ugly enough to unnerve even a Pyg. Roughly resembling a terrestrial catfish the size of a humpback whale with a truncated, unpiscene aft section, it had tiny brown eyes, an underslung jaw, and big rubbery lips surrounding a maw large enough for a garage door. It was obviously a land animal; there were six muscular, splayfooted legs on each side. Warty leathery skin covered its broad back, and a long, absurdly fuzzy tail brought up the rear.

This less than lovely creature was powering toward Professor Whalsitz like a mutant locomotive at a good 30 kph. She faced the thing squarely, multiple chins momentarily quivering with consternation.

Then she shook herself, hawked and spat on the ground, grinned and called, "Come to mamma."

There was a sort of grim inevitability to what followed. Claire and Arthur watched Maud stand her ground before the oncoming behemoth. It huffed and snorted and made a beeline for her, all twelve legs pumping furiously and throwing up a cloud of ruddy dust behind it.

A second or two before that vast mouth was about to close over her, a look which suggested a profound train of second thoughts crossed Maud's face. She stumbled back a step, the pod slipping from her fingers as she reached behind her.

A fraction of a second later the leviathan's ground-scraping lower lip bowled her off her feet, and in she went like a rancid cream puff down a garbage disposal.

Arthur shuddered and looked away, on the verge of tossing his cookies.

Claire noisily munched another mouthful of popcorn.

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The leviathan let out a joyous *roooooooo!* and galumphed onward without slowing.

Claire spat an old maid past her husband's ear, dinging the unpopped kernel off the image of the leviathan's retreating backside. "I thought you said they were vegetarians."

He swallowed hard, his face faintly green. "Maud must have been wrong." He managed a queasy smile. "Done in by her own sloppy work."

She let this paean to perfectionism pass. "Was it just me, or did she want—or at least expect—to be eaten? Up until the last moment, anyway."

"Remember what she said? *Come to mamma.*" He sighed and slumped back in the chair. "You're the brain-picker. What do you figure? Suicide?"

Claire snorted. "Whaletits was too much of an egotist to kill herself."

Arthur gazed up at his wife, an unspoken plea for some sort of logical explanation for what they had just witnessed in his eyes. Irrational behavior unnerved him, and although she provided him with a steady diet of it, he still counted on her to make the outlandish actions of others comprehensible. "Then why?"

"I don't know," she replied with uncharacteristic solemnity, reaching out to give his shoulder a reassuring squeeze. "But don't you worry. One way or another we'll find out."

Claire began that process by embarking on a slow, methodical search of Maud's disheveled digs, efficiently tossing each room as she sought some small clue to what the woman had been up to. While she did that Arthur cleaned the place. She found nothing useful, but he netted $4.28 in lost change.

Three hours later they were back in their own blindship's breakfast nook and finally sitting down to a late supper. As usual Arthur had done the cooking. Claire's culinary skills were on the lethal side of nonexistent. He barely touched the meal he had prepared, still queasy from watching a colleague become a comestible. She ate with her usual gusto, wolfing down both her pork chops after drenching them in chunky red puddles of salsa. Her comments about the other white meat netted her one of his chops as well.

Over coffee and pie—Arthur had a slice of lemon and Claire had been in the mood for mincemeat—they got down to the business of deciding how to proceed. Arthur was holding out for calling it death by misadventure and pronouncing the case closed.

Claire overruled him. "We're not done yet. There was some logical reason for what that old bat did, and I intend to find out what it was."

"Pygs are wackos," he argued. "Maybe she ate one cheesecake too many, her brain arteries clogged shut and she went completely off her rocker."

"And decided that the leviathan was a pigeon and she was a nice tasty peanut?" She shook her head. "I don't think so. Her actions were considered and purposeful."

"You're right," he admitted with a glum sigh. "It's just that thinking about it makes my brain hurt. We saw

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her dig up that pod and open it, an action which she seemed to know would call the leviathan right to her."

"Whereupon it ate her. Which she also seemed to be expecting. But why would she—or anyone—*want* to get eaten?"

"Beats me." He scowled and sat up straighter. "Wait a minute. Let's back up a bit. How did she know that the pods were leviathan lures?"

Claire stared at him a moment, then gave him a truly stunning smile. "Excellent question, my brainy darling. The only answer that comes to mind is *monkey see, monkey do.* She had to be mimicking behavior she'd observed here."

"The indigenes?"

"Most likely." She stood up and drained her mug. "I know it's getting late, but I'd like you to start reviewing all the recordings Maud made. Somewhere in there she saw something that made her decide to become a leviathan's lunch."

He pushed back his chair. "Sure. What are you going to do?"

"Review her notes and logs. Look for clues there."

He let out an evil chuckle. "Brace yourself, her work is always a mess. Even worse than your office. Anything else I should do?"

Claire yawned, then held out her empty mug hopefully. "Make more coffee?"

Claire found it of some note that there were next to no notes.

What few she did find were stored in the human-style computer on Maud's craft. A linkup with their own equipment put several lines of gibberish on one of the piloting station's screens. Claire studied it, recognizing an extremely heavy-duty military grade encryption.

"Sneaky bitch," she muttered. "Both Arthur and I could whack you good for this."

Maud's secret notes had broken one of Why Not U's most fundamental guidelines. The Whuggs wanted constant unfiltered feedback from the Expeditions, so all materials—observations, data, notes, and even wild guesses—were to be put into the Whugg computers which made Expeditions possible. Recordings could be stored in human machines, then the dull spots edited out for downloading on a day-to-day basis; although curious, they weren't interested in staring at an unchanging view of the same rock or tree or solar body for hours on end. Since Whugg computers controlled the editing process, nothing useful got omitted.

The Whuggs's semisentient organoform analogue of the computer was nothing like the glorified abaci humans had invented. It was a somewhat grainy, occasionally lumpy yellow mush that needed no power, input or output devices, software or twenty-four-hour tech support; its only basic requirement was a container capable of holding a material about the consistency of runny Cream of Wheat.

Humans had thought their computers and networks and cyberwhatevers were pretty darn cool until they were shown how to cook up what the Whuggs used, a process with some

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odd similarities to brewing beer. Apart from their awesome computational and seemingly infinite storage capabilities, anything entered into one was instantly accessible on all others in existence, no matter where they were. Not just locally, or globally, but *everywhere*—which included the Whugg home planet itself, which was quite a few doors down the galactic block. The ever-helpful Whuggs had made several attempts to explain the underlying mechanism for this instantaneous transfer of information over multiple light-years of distance before giving up and leaving it at *Just because.*

This allowed them to, among other things, communicate directly to any member of any Expedition at any time they wanted by way of the ship and lab computers. Having a Whugg take a personal interest in your work was a coveted, if quite often baffling-honor.

As a Fixer Claire had a gut-level understanding of something that went against the knotty grain of humans' understanding of how things normally worked. Since all the Whugg computer-stuff was so uncannily linked, a dribble of it in a shot glass had the same awesome capabilities as enough to fill a swimming pool.

The reason she and the other Fixers knew this so well was because the Whuggs were just as intensely curious about the Expeditions themselves as their fruits, and each Fixer was in essence a mini-Expedition studying the Expedition of which he or she was a part. Each possessed special equipment for that task.

Claire knew that if Arthur ever found out about this hidden agenda he would be devastated by the seeming demotion from master of scientific research to just one more lab rat, and explaining that the endlessly curious Whuggs were studying *her* methods and actions as well probably wouldn't help much.

She turned her head to check on him. He was working away at the science station, completely absorbed and totally oblivious. Just the way she liked him.

She slipped her hand inside her blouse and closed her fingers around the locket hanging between her breasts, then subvocalized a command. *Access. Break code.*

Working, the device whispered inside her head, then with no perceptible pause, Done.

She grinned as the screen redrew; the gibberish it had displayed turned into plain English. Whugg computers could translate anything. That code, which might have taken one of Earth's biggest computers several months to break, had been chewed through by the pea-sized yellow lump inside her locket in less than a second flat.

Moments later she was frowning. There were only five entries, and not a one of them made any immediate sense. Cracking the encryption had only netted her:

HOLY SHIT!

GIZZARDS!

NO GENE POOL STAGNATION/DIVERGENCE.

CLEVER BASTARDS!

JACK.

"*This* isn't jack," she muttered dark-

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ly. "What the hell were you up to, Maud?"

"Claire?"

"Yeah?" she answered, shaking herself from her reverie. The last thirty minutes had been blown sitting there staring at those five enigmatic entries, and she'd gotten nothing but a headache for her troubles.

"I think I have something."

"I'm glad someone does." She got up, detoured to pour herself fresh coffee, then went to look over her husband's shoulder. "What have you got?"

"Check it out." On the screen before them one of the indigenes strolled nonchalantly into the clearing in front of the missing professor's invisible blindship. The alien was bipedal, about 1.3 meters tall, and walked upright on flat scaly feet.

"The fellow looks rather like a turtle without its shell," Arthur commented dryly.

"A turtle with bat ears, a furry tail and teeth like a politician." Claire leaned closer for a better look. "It's wearing a belt, a knife and carrying a . . . purse?"

"A carry sack of some sort," Arthur agreed. "Once again the sketchy information I have indicates that they are hunter-gatherers, their development roughly equivalent with the later stages of our own Stone Age. I can't tell you anything about their social habits. Studying that was supposed to have been Maud's job."

"Clever bastards," Claire murmured.

He frowned back at her. "Why do you say that?"

"A notation Maud made sometime before she turned herself into a leviathan yummy."

Arthur turned back toward the screen. "OK, here we go. This is what I saw that made me call you."

The indigene ambled over to another of the helical-trunked trees, knelt down, and, using the long nails on its broad flat hands, unearthed a long black pod identical to the one Maud had dug.

"You found the monkey-see," Claire muttered with a pleased nod. "Good spotting, love."

The alien sauntered to the center of the clearing and deftly unzipped the pod, releasing an expanding mass of bubbles. Then it waited, its hairless head bobbing rhythmically.

"Stone age, you said?"

Arthur nodded. "There seem to be similarities."

"Must be listening to rock music."

He sighed, then pointed to the data track. "Here we go. There's a leviathan coming."

"And Elvis hears it." The indigene turned its head and stared intently into the surrounding growth. Its eyes were large and round, like a lemur's. Its ears swiveled to home in on the sound, but nothing in its posture suggested alarm.

They watched as the leviathan hove into view, thundering along on its twelve muscular legs. There followed a reenactment of Whalsitz's fate; the humongous life-form jonahed up the indigene, let out a joyful *roooooooo!* and beat a duodenarypedal retreat.

"It *asked* to be eaten!" Arthur ex-

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claimed, freezing the image, then swiveling his chair so he faced his wife. "I just don't get it."

"Neither do I," she admitted, then yawned and stretched. "We're both whipped and hip deep in the bizarre. What say we call it a night and start fresh in the morning?"

"What about Maud?"

Claire chuckled and helped herself to a seat in his lap. "The damned fool turned herself into fast food. I still intend to get to the bottom of this mess, but guess we can write off rescue as an option. So there's no need to pull an all-nighter at work."

She squirmed around, batted her eyes and toyed with the buttons of her blouse. "Howzabout instead we pull one by you and me becoming the first humans to get lucky on this planet?"

Arthur blinked furiously, crimson creeping into his cheeks. Her sudden changes from dedicated investigator to sex maniac always caught him off guard. "But what about—I mean, with Maud dead and all, doesn't that seem kind of, well. . . ." He shrugged.

"Don't worry, darling," she cooed. "It's OK." She unbuttoned her blouse, pulled it open. "See? I'm wearing black!"

Arthur snored blissfully on as Claire kissed his forehead and then eased carefully out of bed. She grabbed her robe and slipped stealthily out of their bedroom, closing the door behind her.

She headed for the kitchen, blinking against the light and shrugging on the robe as she went. After nuking a cup of leftover coffee to reheat it, she returned to the blindship's living room and settled herself into the chair at the science station.

Most times sex served as the old married folks' sleeping potion, but every now and then it had the opposite effect, leaving her all revved up and ready for something. Arthur had just given her one hell of a jump-start. She figured she might as well put it to use.

It took her only a moment to call up those five decrypted but still cryptic entries. She took a swig of coffee and took another run at them.

HOLY SHIT. That usually denoted surprise and or amazement. Something here must have really grabbed the old bag's attention. Something she was determined to hide. None of her recordings had been edited and passed over to the Whugg systems, either. Why was she playing so fast and loose with the rules?

GIZZARD. Whenever Arthur cooked chicken he always sautéed the gizzard in butter and garlic for himself. Canadian cuisine. Go figure. People didn't have gizzards, but birds did. Was it that or the crop they used to macerate food, using swallowed stones as grinders? A perfectly bewildering and yet still boring lead for Arthur to follow in the morning.

NO GENETIC STAGNATION OR DIVERGENCE. Maud had to be talking about the indigenes, didn't she? They were her field.

Claire frowned and took another sip of coffee. Pitstop's peculiar topography kept the pockets of life on it isolated from each other. Each pocket should have been a separately evolv-

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ing "island" with its own specialized biologic adaptations, like Earth's own Australia or Hawaii. Going on the assumption that they didn't have some highly exotic reproductive mechanism to compensate, each indigene grouping should have been inbred and to some degree divergent from each other. Maud seemed to be saying that they weren't. Why? How? And for that matter, how was it that there were indigenes in almost all of the habitable pits? They couldn't have all appeared everywhere all at once, could they?

She shook her head. Arthur could probably give her answers to those questions, but she hated to wake him up. Let this one slide for now and on to the next entry.

CLEVER BASTARDS! Claire sat up straighter. Had Maud figured out the answer to the previous poser? And if so, why the note of admiration? If letting yourself get eaten was clever, then pastrami and Popsicles had more on the ball than people.

The last entry waited for her. JACK.

She leaned back in her chair and slurped some more coffee, letting associations flow.

Sprat. O'-lantern. Be nimble. Up the price, the front bumper. London, Kennedy, the Ripper. Jack Hire, that opera catawauller Arthur liked so much. Jack Toricelli, the gas giant specialist? No, he hated Maud's gargantuan guts just like every other sane person who dealt with her. The woman had no friends, and her family had disowned her years before. What—or more likely who—the hell had that miserable Pyg been talking about?

Time to cheat a little bit. She put her mug aside, slipped her hand into her robe and closed her fingers around her locket. Since she was alone she didn't have to subvocalize.

"Access." she said quietly. "Jack."

Parameters? the Whugg computer whispered inside her head.

"Be like that." She rubbed her chin. "Try . . . try Pygs named Jack known to Professor Maud Whalsitz."

The reply was immediate. 'Monterey' Jack Porklowski of Encino, California, USA, Earth.

"Give me a thumbnail bio."

Caucasian male, aged fifty-two, single. Multimillionaire art dealer and owner of the Handy Hocks chain of pawnshops. Currently under investigation by several agencies for tax evasion and alleged dealings in items either known to be stolen or, at best, of questionable provenance.

Now she was getting somewhere. "What sort of items?"

Works of art. Antiquities. Alien artifacts.

"Friends with a fence. How interesting. Has Maud had illicit dealings with this man in the past?"

No direct evidence.

Claire was undeterred by this response. One thing Whugg computers had in common with their retarded silicon brethren was their annoying habit of never answering questions you didn't ask. She considered her next query carefully before speaking.

"OK, correlate probability based on contested alien artifacts traced to Jack and believed to have originated in systems where Maud has been on Expedition."

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Probability approaches certainty.

There was a slight pause, then a new voice spoke inside her head. It was as deep and richly musical as the lowest notes from a pipe organ, and it shimmered with a vast oceanic amusement. Excellent question, little one!

Claire grinned happily. "Thanks, big guy! How are you doing, Boss?"

Intoxicatingly pleasured. I am aquiver. This situation is most deliciously intriguing. Its resolution shall indeed be a root-swelling feast of revelation.

"Intriguing to just you, or all of you?"

Shifting attentions and competing megamultiplex inputs to our linked solitaryseparateselfsame. We/I am busy busy busy sensing/thinking/learning/sharing/wondering/marveling/integrating/understanding what we ponder and pondering what we don't understand and ever still wondering what might come; the growing circle of knowing casting wider horizons of unknowing. I/we percolate with tickled curiosity.

"Dumb question, huh?"

The Whugg laughed, its mirth tremendous and splendid, like having god bust a gut over a real knee-slapper. No such thing, child, it chuckled fondly, then was gone.

Claire drew out her pendant and kissed it.

"Damn! But I love my job," she whispered before putting the locket away and going back on the clock.

"Replay."

On the screen before her Maud once again toppled inside the leviathan's gaping maw like an orange-frosted lard-enhanced bonbon.

"Hold." The image froze with the professor's loafered feet protruding like a forked Florsheim tongue.

"Roll back." The creature regurgitated its Pyg meatpie neat as a cat hacking up a hairball and backed away.

"Hold." She scratched her chin thoughtfully. "Pan image 90 degrees clockwise." Although she was viewing it on a flat screen, the recording was holographic. The viewpoint swung smoothly around to a point about ten meters behind Whalsitz. "Zoom to distance halved." The big woman's bulbous form expanded like an inflating weather balloon.

The new vantage point and close-up revealed that a flaccid army surplus knapsack was slung over one meaty shoulder and a sheath knife was clipped to her belt.

"Proceed in slo-mo, quarter speed." Claire once more watched the leviathan bear down like a rubber-lipped surrealist bus. This time she saw how at the last moment Maud had gone for her knife. She'd gotten it out, but it had tumbled from her fingers a fraction of a second before the leviathan got her. Not that Claire could see where it would have been much help.

So the question had been modified to: *Why had Maud carried a knife and empty bag while letting herself get eaten?*

Dammit, the answer had to be there somewhere. Had to be! Just as she was about to run the loop one more time before going on to review later record-

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ings, a discreet signal sounded from the area monitor. She changed over to real-time display to check it out.

There was a leviathan approaching the clearing. She settled back to watch and see if another indigene came out to play midnight snack. Maybe it was a lemming thing. . . .

Several minutes later she was shaking her head in wonder and muttering, "You clever, clever bastards!" over and over as she began hunting further clues on the recordings.

Now that she knew what to tell the system to look for, it didn't take her long to find what she sought.

Arthur shuffled out of their bedroom in his underwear, yawning and rubbing his eyes. "Claire?" he called, "How long have you been up?"

No answer came.

Muzzily concluding that her wifely ESP had as usual sent her to take over the bathroom just before he needed it, he mooched on into the kitchen to get some caffeinated brain-starter in him while he waited for his turn to use the plumbing. She always did this to him, her preemptive precognition also extending to magazines and newspapers, the phone, the vid remote, and the last beer in the fridge. These morning waits were the worst. There were times he thought his marriage vows should have been *To have and to hold your water.*

By the time he'd sucked down one cup of coffee she still hadn't come out. Muttering dire threats in which the words mascara and maiming figured prominently under his breath, he went to hammer on the bathroom door.

"Claire? Hurry it up, will you?" he called, giving the door a smart rap. "Do your makeup—"

It swung open under his hand.

A tendril of unease curled through his innards when he saw that she wasn't inside. After jittering anxiously from foot to foot while attending to urgent matters, he went looking for her in every one of the ship's rooms.

"Don't do this to me, Claire," he begged, going to the pilot's station by the bay window and signaling Maud's ship to see if she had gone over there. The craft reported itself to be unoccupied.

He headed for the science station at close to a dead run. There he found a note posted on one of the screens. It read *Seed you later, husbandator!*

"No," he moaned, shaking his head from side to side in denial. "You wouldn't. You *couldn't.*"

Fearing the worst, he instructed the system to backtrack through the most recent recordings made of the area outside to prove to himself she couldn't possibly have done anything as crazy as what he suspected.

She had.

"Why, Claire, *why?*" Arthur sighed, taking another long pull from the bottle of rye whiskey in his hand.

Half the morning was gone. He had raged. He had cried. He had screamed and kicked things, quite possibly breaking a toe in the process. A combination of pain from his foot and the despair chewing at his heart had made him haul out the bottle and take that first drink. The ones that followed had just sort of happened. At

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about the fourth he'd half-decided to go looking for her, and even gotten as far as putting on an envirosuit, but in the end he had gone back to the fifth instead.

His bothersome beautiful beloved Claire grinned back at him from the screen in formerly living color, frozen in the act of blowing him a kiss in her final moments before the leviathan had gotten her. Her face wore that crazed look he knew—and secretly loved—so well, her dark eyes glowing with reckless pleasure. She'd known he would see this, and had waved good-bye before—

He took a shuddering glug and hugged the bottle to his chest, the hooded yellow Teflon fabric envirosuit and his tragic expression face making him look like a bereft banana on a bender. Every Canadian boy grew up knowing American women were trouble, and she was clearly and inarguably more trouble than any ten normal daughters of Uncle Sam. Why had he ever let himself get involved?

A sound that was half a sob and half a laugh escaped him. Like he could have stopped himself! Not two minutes after they had first met and begun working together she had begun driving him crazy. Before the month was out he'd known he was going to have to either kill her or admit that he loved her. That some deep, unsuspected, probably masochistic part of him liked it. Craved it. That when he was with her he was alive in a way he'd never been before. Life since then had been an adventure, and himself a reluctant adventurer.

He knew himself to be a dull man. Cautious. A plodding *i* dotter and *t* crosser *par excellence*. He wasn't a rule-breaker or risk-taker; in their partnership his role was to be the boron moderator of her fissioning impulse, and in a strange way her protector.

His rules and checklists were meaningless now, and in spite of all the times he had threatened divorce, he now knew that he was utterly, abysmally, and irrecoverably lost without her.

"Wha' should I do now, darlin'?" he asked her image slurrily. She beamed back at him with the face of a peyote-eating Mona Lisa.

One part of him wanted to get drunker than he'd ever been in his whole life, drunk enough to die from. Another part wanted to go hunt down that miserable rubber-lipped wife-eating alien sonofabitch and make it *pay*.

One of the fundamental guiding principles of Expeditions was that no major life-forms were to be harmed, and on that point the Whuggs were figuratively and literally immovable. The monster that ate his Claire had to be classified as a major life form just on size alone. Killing one on purpose would be effectively killing his career as a part of Why Not U at the same time.

"Big deal," he sniffed, wiping away a tear and taking another numb swallow of whiskey. Going back to being a plain vanilla administrator mired in the hidebound life he'd led before she came along would be like dying anyway.

"T' hell with it," he growled, struggling to sit more or less upright. Enough maudlin muddling, mister!

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"System. Exscrap—eggrap—uh, figure out th' track of th' leviathan on th' screen. Use, uh, any an' all 'vailable data from them orbiting whatchamacallits to locate it so I c'n—"

His longest drink of whiskey yet, tears running down his eyes and excess liquor dribbling down his chin.

"So I c'n *shoot* th' bloody thing!"

There. He'd said it. Breaking the rules still horrified him, but darn it, a man had to do what a man had to do! Speaking of which . . .

After three tries he managed to escape the chair's clutches. He turned, oriented himself in the general direction of the bathroom, swung one leg out for that critical first step, missed the floor completely and proceeded to fall flat on his face, out cold even before his head hit the carpet.

What finally roused him was the bellowing.

The sfhere sheathing the blindship was completely soundproof, but the sensors monitoring the area were still active and keyed to respond to significant changes in ambient noise.

Bellowing was a rather pallid description of the unearthly sound which blew him from his stupor and set him to thrashing wildly around on the cheap shag carpet. It was a vast mournful baying *Barrrrrroooooooooooo* that made an air raid siren sound like a squashed kazoo blown by an emphysemic.

Arthur floundered around in blind panic, banging his head twice on the bottom of the chair before getting past that barrier, lurched to his feet, and when he slapped a hand onto the board to catch his balance he hit the mute button by sheer beneficent accident.

His ears still ringing, his head pounding, and his brain mired in that muddy no man's land between roaring drunk and rawly hungover, he tried to flog his mind into action.

A dim recollection of instructing the system to track down the monster that had eaten Claire trickled back into his consciousness like a mixture of glue and broken glass. He squinted at the reads. The damned thing had been found, and it was presently located—

—Right outside!

On the third try he got the system shifted over to displaying a real-time view of the clearing out front.

There it was, but strangely enough the gargantuan creature seemed to be in almost as much distress as Arthur himself. It was crouched on the hardpan outside in a posture that rang corroded bells in his aching brain, its broad blunt head twisted to one side and its mouth open in a soundless howl of obvious anguish.

"Suffer, you bastard," he growled thickly. "But stay where you are! I'm coming to put you out of your misery!"

The leviathan shook itself like a wet dog and swung its big body around as if trying to dislodge something clinging to its hindquarters, its fuzzy tail curled into quivering rigidity over its leathery back.

Arthur stared slackjawed as its rear end hove into view, his eyes nearly popping out of his head when he saw

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that sticking out from under the leviathan's tail was a pair of legs.

Legs he knew quite well from being married to their owner.

And they were *kicking*.

The leviathan's small, muddy brown eyes seemed to follow Arthur hopefully as he half ran, half edged around its heaving flanks. Claire's stun-rifle banged into his spine with every step. He'd brought it along in case the colossus tried to eat him as well, but the thing seemed to be acting almost tame. When it had seen him coming it ceased its mournful baying, squatted down and lapsed into a shallow stentorian panting, like a monster mother in labor.

Arthur was not by nature a man to rush into things. He was the sort who, if he found his shoes on fire, would give considerable deliberation to whether water would be best poured over or into them.

But for once in his life he didn't waste time debating methodology, pondering the merits of a modified Lamaze technique versus some other carefully researched approach. Instead he simply took a running leap up into the air, and with an atheist's prayer for efficacy on his lips, seized hold of his wife's ankles with both hands and let his full weight drop.

His technique, although crude, unconsidered and not particularly scientific, was sufficient unto the task. Claire came free like a cork from a champagne bottle, accompanied by a loud *pwop!* and followed by a glittering ten-bushel burst of leviathan dung.

They hit the ground in a tangle amongst the falling fragrant fecal confetti. The leviathan threw back its head and trumpeted a gobbling cry of pure unconstipated joy, swung around to give him a thankful lick with a mattress-sized pink tongue, then began galumphing gleefully away.

"Claire! Are you all right?" Arthur demanded, hauling her up from a sparkling lavender drift and shaking her. She wiped her face and spat, gave him a loopy grin, then grabbed him by the ears and fastened her mouth to his.

After she let go, and while Arthur was wiping his own mouth and spitting, she staggered to her feet. "Come on, my hero," she panted. "We have to get back out of sight!"

He gaped up at her in confusion, wondering how she could make such an abrupt switch from chewing on his tonsils to ordering him around. "What—" he began, "I don't—"

"No time," she huffed, dragging him to his feet. "The indigenes aren't supposed to know we're here, remember?" She tightened her grip on his hand and began towing him back toward their ship.

Arthur let her, obscurely pleased that things had so quickly returned to normal.

As she had predicted, a dozen of the locals came running onto the scene less than a minute after they were back inside and recloaked. Arthur peeled off the envirosuit and wiped his face, and Claire scraped clods of dung off while watching the

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beings mill around the clearing, demonstrating the nearly universal humanoid signs for confusion by scratching their hairless heads and shrugging their thin shoulders. After a few minutes they gave up and headed back toward the way they had come, adding bemused head-shaking to the roster of gestures they shared with their clandestine observers. The Whugg system could have translated what they were saying, but it would have been redundant.

"OK Claire, I think you'd better tell me what the hell you thought you were doing!" Arthur said in the most commanding tone he could muster once the aliens were out of sight. He even flung down his towel for emphasis.

She responded by giving him the hairy eyeball, hands on her hips. "You've been drinking, haven't you? You know you can't hold hard liquor."

"Well, maybe I did have one or—" He blinked, then scowled. "Don't go changing the subject, dammit! Why the bloody hell did you go out there and let yourself get eaten? That was the dumbest, most—most—" Words failed him and he flung up his hands in baffled outrage.

"Oh, getting eaten was safe enough," she answered mildly. "My only miscalculation was in my ability to get off the bus."

The look he gave her suggested that he suspected brain damage. "Off the bus? What the hell are you babbling about, woman?"

Claire lifted an arm and sniffed, made a face. "Yuck! I smell like—well, you know. Tell you what. You wash your face and hands then make us something to eat while I take a shower. After we get some breakfast—" she glanced at her watch, "—better make that brunch, in us then we can talk. OK?"

"I guess," he allowed. She was pretty rank, and his body throbbed with a need for coffee to replace spent adrenaline.

"Thanks. You're a prince." She leaned over to peer at the various readouts, then regarded him with one raised eyebrow. "You were tracking my leviathan. You weren't plotting some sort of drunken macho revenge, were you?"

He couldn't look her in the eye. "Well . . ." he began.

A knowing grin appeared. "Of course not. What was I thinking?" She raised her voice. "System. Use previously employed methods to extrapolate the probable position of the leviathan that swallowed Professor Whalsitz."

Arthur's eyes went wide with realization. "Wait a minute! You got eaten and you're still alive! Do you think Maud might be?"

She shook her head, flakes of leviathan dung falling from her hair like lavender dandruff. "I doubt it. We'll know for sure soon enough. Now get making some coffee and food, would you, love? I've had kind of a crappy morning."

Arthur watched her head for the bathroom, torn between aggravation at being left in the dark and ordered around, and a tremendous sense of relief that he had her back again.

The sense of relief was greater.

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Probably almost as profound as that poor leviathan had felt to be rid of her.

Chuckling to himself he went to wash, and then whip up a brunch worthy of the occasion.

"OK," Claire said after swallowing the last bite of her fifth Belgian waffle and putting down her fork. "Now I'm ready to be debriefed." She lounged back in her chair and regarded him from under lowered lashes. "Or maybe you would rather I answered some of your questions instead."

"Keep your briefs on," he replied tartly, refilling their coffee cups. "And tell me how you could so blithely decide to let an alien monster eat you. Because if it's something medication can fix, I'm getting you a prescription."

"I knew it was safe, and I wanted to find out why Maud let one eat her."

"Safe." He shook his head. "We'll hash that one out later. Did you figure out what Maud was up to?"

"I sure did. And it *was* safe. Maud's recordings and a couple other things let me figure out what she had, namely the indigenes' relationship with the leviathans. I knew that getting swallowed wasn't as bad as it looked. The locals do it all the time."

"But *why?*"

She beamed at him. "For the same reason the chicken crossed the road."

Arthur could feel his headache coming back. "To get to the other side?" he grated, unamused by the punch line.

"Precisely. Maud had done some high-altitude survey work before touching down, and what she saw then indicated that the indigenes, though completely cut off from each other by the nearly airless ridges between their inhabitable pits, hadn't stagnated or diverged genetically. That indicated the direct or indirect transfer of genetic material. How? Only one creature here was capable of crossing the barriers, and did so on a regular basis. That was the leviathans."

"She never mentioned that," Arthur put in.

"Maud withheld a lot of things—and had been doing so for some time now, releasing only those findings which wouldn't point to whatever artifacts and information she'd been pilfering."

Arthur paled and almost dropped his cup. "Maud was *stealing* from sites?"

"Every chance she got. Now let's get back to the leviathans. Anatomically speaking, they're a muscular, bone-reinforced tube surrounding a single huge combination stomach and lung."

"You mean they're, um, hollow?"

"Pretty much. After you go in one's mouth you pass through a funnel-shaped ring of muscle and emerge in a big open space. The walls are lined with the feathery, fan-shaped, gill-like structures that keep the air circulating and extract the gases they need. The floor is lined with interconnected muscular pits where the vegetation it eats is macerated and digested. As long as you watch where you step it's fairly comfortable inside. There's air and heat, some sort of bioluminescent light, and even a salad bar if

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you're not too fussy. I've had worse plane rides."

Arthur rubbed his jaw, intrigued. "You're saying there's a habitable space inside each animal."

"I am, and if you think that's something, wait'll you hear the rest. That huge lung allows the leviathans to hold their breath the whole time they cross from pit to pit, which makes them in essence self-powered, pressurized transport. So if a local wants to get to the other side, it just whistles one up and rides in style."

"But how do they know where they'll end up?"

"There's this small sort of pouch with a membrane you can see out, and an exposed knot of ganglia that can be manipulated to guide the thing. This clearing is like the local bus stop. The leviathans may be docile, but they're just too big and too dumb to be allowed inside their villages. In fact, I think further study will show that the indigenes have definite overlapping routes set up. They are, as Maud said, clever bastards."

"So you . . . drove that leviathan back here after it ate you?"

"Neat, huh?"

That wasn't quite the word that sprang to his mind. "But if they are so docile, why didn't you just climb back out its mouth instead of its, um, back door?"

She shook her head ruefully. "I couldn't. That front funnel is strictly one-way. Oh, air can go back out when the ambient pressure is low enough and the leviathan wants it to, but the things have an incredible gag reflex. Believe me, I know. What it boils down to is their having one-way airlocks at either end, one in and one out. When a leviathan reaches its destination it takes a deeeep breath and then forcibly flushes out all the stale air, waste materials and any passengers it happens to be carrying. The indigenes seem to know some sort of trick for moderating that process. I figured out how they got back out when I saw an indigene, ah, unloaded." She laughed. "Unfortunately I'm a bit larger than its usual passengers and got stuck in the exit."

"Remarkable adaptation," Arthur murmured thoughtfully, thinking of the stir this would cause in academic circles. Then he frowned. "That still leaves two questions unanswered. What do the leviathans get out of this arrangement, and why did Maud go inside one? She must have been after more than a simple joyride."

"She was. Your two questions are connected. The pods used to call the leviathans are like candy to them, and may even alter their biochemistry to make crossings easier, like a carbo load before a workout. Then there's a second benefit, and the solution to the riddle. Near as I can figure, during the crossings the indigenes make the leviathans stop in certain places, take a deep breath, slip out the back way to go outside for a minute or two so they can dig up digestive aids for their pets, then crawl back inside through that oral airlock, which opens just enough to let them back in without any serious loss of air. Then off they go again."

Arthur didn't get it. "Digestive aids?"

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"Stones, like the gravel some birds swallow. Remember, the leviathans don't have any teeth—" She laughed. "—And a good thing too! Stones in those muscular stomach pits help grind up the vegetation they eat. One certain kind can be dug up on the ridges between the pits. Once again, there may be some extra nutritional benefit, trace minerals maybe."

Arthur nodded. "OK, that makes for a sensible symbiosis. But it still doesn't explain why Maud wanted one to swallow her."

Claire's eyes gleamed with merriment. "Actually it does. Tell me, Mr. Science, what's unusual about leviathan dung—besides its size, that is."

He thought it over. "It glitters?" he said uncertainly.

"Excellent observation. Those sparkles are dust and chips from the grinding stones." She reached into her pocket. "Here are a few half-worn-out stones I grabbed while I was inside."

She opened her hand, and a dozen gleaming gemstones the size of robins' eggs clattered onto the table between them.

"Almost there," Arthur called from the science console. "You should be able to see it any time now."

"Got it," Claire replied, peering out the bay window as she piloted the ship on manual. The ungainly blindship turned slightly and began settling down toward the sunwashed scarp.

"Poor thing," she murmured as she put the craft down beside the dead leviathan. "It bit off more than it could poo."

"No life signs at all," Arthur reported tightly as he deployed the spytes. "Let's get this over with."

Claire went to stand behind her husband with her hands on his shoulders as the spytes flitted around the massive carcass like curious flies. They did not have to wait long for the answer they sought.

"Old Whaletits made a bad mistake by going into that poor creature to make her pile." Arthur said mournfully.

Only the woman's head had emerged into the killingly thin air, the rest of her corpulent body too large to pass. A breather mask dangled uselessly inches from her mouth.

"Yeah," Claire agreed. "Thanks to being greedy she ended up looking like one—"

The Pyg's face was the dark purple of a strangulation victim, her eyes wide and staring, her tongue black and protruding.

"—In the end."

As Science Master, Arthur had final say in the collection and disposition of specimens. He was inclined to leave the unlucky leviathan and its fatal passenger for the exobiologists to separate and dissect. Claire agreed that there was no hurry in reclaiming Whalsitz's body for an autopsy; cause of death was fairly obvious.

Their work on Pitstop done, they lifted off and headed back to where the Expedition's mothership waited out by the system's sixth planet so they could deal with the list of problems which had arisen while they were gone. Why Not U being a largely human enterprise, there were always problems, and quite often they were

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ones the two of them had to work together to solve.

Before they were even three kilometers up Arthur was bitching about her driving, and Claire was gleefully terrifying him with acrobatics and bludgeoning him with bad jokes.

Listening in, you might have thought that they didn't get along, and divorce had to be just around the corner.

But really they couldn't get along without each other.

Which made their marriage very convenient indeed. ■

IN TIMES TO COME

Our April cover is for "Finder's Fee," a lively interstellar adventure by David Alexander and Hayford Peirce. Most of the action takes place on a single, decidedly exotic planet, but getting there is not always half the fun. There's a big problem lurking behind the obvious local ones, and sometimes to solve any of a group of problems, you must solve all of them—no matter how unrelated they might appear. And, of course, the person who does that deserves a little something for his trouble. . . .

We'll also have novelettes by G. David Nordley and Paul Levinson (the latter a new adventure of detective Phil D'Amato), and a follow-up to Wil McCarthy's popular short story "The Dream of Houses" (titled, appropriately, "The Dream of Castles"). Chris Vuille, Ph.D., provides the fact article, on "Relics of the Big Bang," bringing together some of the newest ideas and discoveries about the oldest event.

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The Return, E. C. Tubb, Gryphon Books (Gryphon Publications, P. O. Box 209, Brooklyn, NY 11228), $?, ? pp. (ISBN: ...).
Pandora's Box, E. C. Tubb, Gryphon Books, $15 (tp), $40 (ltd, signed hc), 105 pp. (ISBN: 0-936071-55-9, 0-936071-56-7).
Temple of Death, E. C. Tubb, Gryphon Books, $15 (tp), 96 pp. (ISBN: 0-936071-63-X).
Exodus from the Long Sun, Gene Wolfe, TOR, $23.95, 384 pp. (ISBN: 0-312-85585-0).
The Other End of Time, Frederik Pohl, TOR, $23.95, 349 pp. (ISBN: 0-312-85644-X).
Idoru, William Gibson, Putnam, $24.95, 292 pp. (ISBN: 0-399-14130-8).
Holy Fire, Bruce Sterling, Bantam, $22.95, 325 pp. (ISBN: 0-553-09958-2).
Infinity's Shore, David Brin, Bantam, $23.95, 524 pp. (ISBN: 0-553-10173-0).
The Beacon, Valerie J. Freireich, ROC, $5.99, 349 pp. (ISBN: 0-451-45397-2).

SCIENCE FICTION ON THE WEB

If you've been reading SF for a few years, you probably recognize the name of E.C. Tubb. He is a prolific British writer who began publishing in 1951 and eventually achieved his greatest commercial success with the never-ending saga of Earl Dumarest, who left Earth as a young man and could never thereafter find his way home, though he tried and tried and tried through thirty-one adventurous volumes of the saga. He lost his US publisher (DAW Books) when Donald A. Wollheim died, and numbers 30 and 31 were published in England. No. 32, **The Return**, appeared in France in 1992 (in 1986, Gerard de Villiers of Plon/GECP Publishing began running Dumarest in a successful series of uniform editions under the banner "L'Aventurier des Étoiles" ["Adventurer of the Stars"]), and now, at long last, it is scheduled to appear here, from Gary Lovisi's Gryphon Books.

What's it all about? I don't know, for I have seen only the introduction, by Britisher Philip Harbottle. All I can say is that it apparently concludes the series with a return home at last. It may be open-ended, for, according to Harbottle, Tubb planned all along to segue into a new adventure saga on Earth.

Gryphon is also releasing other Tubb material. **Pandora's Box** and **Temple of Death** were written for the British short novel (novella) mar-

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ket of the early '50s. But that market collapsed, leaving the manuscripts sitting on his desk. The former novel, eventually published as *The Spore Menace* in Germany, deals with an attempt to smuggle contraband spores from Venus to Earth. The latter, seeing print for the first time now, concerns an exceedingly secret Martian temple; the Martians severely punish every Earthman who comes too close or shows too much interest, until one of their victims is recruited to break the taboo and uncover the sinister truth. Both are a bit raw (Tubb was young then) and dated (we know more about both Venus and Mars, society has changed a bit, and SF has matured stylistically and thematically), but we can recognize Tubb's gift for momentum, which kept Dumarest moving for so long.

Exodus from the Long Sun concludes Gene Wolfe's "Starcrosser's Planetfall" series, set largely in and around Viron, one of many cities in the Whorl, a vast cylindrical starship illuminated by a "long sun" that extends the axis of the cylinder. The chief character is Patera Silk, an augur or priest, who finds himself struggling to save his temple/school and by extension his entire people from financial, political, and climatic chaos. By now we know that the gods with which he must deal—all but his own special god, the "Outsider" (apparently the God of Judaism, Christianity, and Islam)—are downloaded versions of the Whorl's builders, their mission to guide the Whorl and its people to some distant world.

Previous volumes (*Nightside the, Lake of the, Caldé of the Long Sun*) detailed Silk's acceptance of his mission, discovery of complications, loss of innocence, and ascent to the leadership (Caldé-ship) of Viron. Now he must somehow end the war against Viron's usurpers, keep the women troops of neighboring Trivigaunti (ostensibly come to his aid) from taking Viron over, and see to it that landers are launched. Success is inevitable, though the path thereto is often a mite convoluted.

Such a précis hardly does the tale justice, but if you have followed the series so far, you need no more. Wolfe is a remarkably inventive and rich writer, immensely skilled, as blessed with the writer's gifts as anyone could wish. You are bound to be pleased.

However, as I read this one, I kept feeling that Wolfe was leaving pieces out, skipping over crucial events, perhaps because he had to trim the length of a longer manuscript. At the end I wanted to know more about the Flyers who call themselves Crew and regard the groundlings as Cargo, about the gods who live in Mainframe, and finally about the Whorl's destination and life after the landing. There is room in Wolfe's creation for another book, just as there turned out to be in his previous *Book of the New Sun* tetralogy.

Frederik Pohl has been writing science fiction for a looonngg time, folks, and in the course of his career he has been responsible for some very nice tales. The Heechee series comes to mind immediately, but it is

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by no means alone; checking my index to all the novels I've covered in my columns here, I find his name (alone or in collaboration with others) on 19 items.

He's also been responsible for some pretty forgettable, pedestrian fiction, of which the latest example is **The Other End of Time**. In this novel's future, the American space program is defunct, the economy's a mess, Florida has for all practical purposes seceded, those who can afford it have personal bodyguards, and space aliens have sent an ominous message showing seven weird creatures menaced by an eighth and implying that we may be menaced as well.

The general public says, "That's cool," and hangs dolls of the aliens from their rearview mirrors. But government is worried, and when the privately owned but out-of-order Starlab in orbit high above Earth emits strange radiation, and seems to have extra bits inexplicably added to its structure, and when astronomer Pat Adcock—director of the foundation that owns Starlab—begins to make plans to visit Starlab, secret agent Dan Dannerman is assigned to infiltrate the foundation, get close to his cousin Pat, and get whatever goodies may be gotten for the sake of national security. So far, so fine, but hardly have Dan-Dan (his childhood nickname) and Pat-Pat (not really; I'm kidding) and the rest of their intrepid band stepped aboard Starlab than the aliens knock them on their heads, make copies, bug one set, wipe its memories, and let it return to Earth, and ship the other set via tachyon beam to a cell on a very distant world, there to be studied.

What follows amounts to prolonged pacing back and forth within the cage. Echoing screams from elsewhere in the alien laboratory complex suggest that other copies are being studied in very unpleasant ways. Occasional booms, light flickerings, and floor rattlings suggest that the place is under attack.

The truth that slowly emerges hardly seems startling enough to justify a novel. There are first contact, alien villains, a promise of resurrection at the end of time, and a threat of annihilation for Earth, but the technology that permits the aliens to copy Dan-Dan et al. at will, necessarily renders the drama pointless. Escape just does not feel like escape when a new copy goes back in the cell.

This one made me want to pace, too.

William Gibson has outdone himself with **Idoru**. It's an ingenious and charming glimpse of how virtual reality will one day enable people to do things they could hardly dream of before, and even of how the barrier between "virtual" and "real" may crumble.

The tale begins with the misadventures of Laney, a fellow with a talent for seeing "nodal points" in vast skeins of data. He is employed by a media outfit that pursues scandal in a way to shame a tabloid, until he sees an incipient suicide, tries to intervene, fails, and is fired. His next job is for the managers of Lo-Rez, a popular musical group, who want to figure out what Rez is up to with his announcement that he plans to marry

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an "idoru," a computer-synthesized figure designed to serve as an image in his videos.

Now meet Chia Pet McKenzie, Lo-Rez fan in Seattle. Her fan club, alarmed by rumors of the idoru business, sends her off to Japan with a Daddy's frequent-flyer miles to investigate. In the airport she is befriended by a strange woman who asks her to carry her suitcase through customs. Later she learns that the woman slipped a mysterious package into her bag. In due time, we learn that gangsters are *very* interested in that package, and Chia and her Japanese hosts—fellow fans—are marked for death.

Of course, the two threads intersect, and the package turns out to hold a remarkable hope for Rez and his bride (all I will say is that it involves nanotech). There is a strange vigil at the Hotel Di love hotel (Gibson can be downright puckish). There is an awakening for Chia. And it all leaves the reader feeling remarkably satisfied.

And Laney? With the aid of Rez's bodyguard, an Australian "toe-cutter" named Blackwell, he makes out just fine, thank you.

Bruce Sterling is as linked as Gibson to the SF cyberpunk/cyberspace/virtual reality phenomenon, and he too has done remarkable work. His latest, **Holy Fire**, thus has some expectations to live up to. It largely succeeds, for this novel is inventive and ingenious and thoughtful and well worthy of your attention. However, I did find it less charming than Gibson's *Idoru*. Perhaps for this reason, I also found it a bit less satisfying.

Sterling may have begun (at least in his own mind) with the old crack that youth is wasted on the young. Given that, he could extrapolate a future where Western culture has come to be dominated by the old, in fact—given the advances to be expected in the area of life extension, and considering that a graying populace will be ever more willing to fund research into life extension technologies—by the ancient. The young are few and deprived of hope, for their everlasting elders have all the money, all the clout, all the choicest jobs. All they can do is goof off, party, and try to be "vital" with fashion, poetry, and art.

Meet Mia Ziemann. She's one of those elders, a dried-up prune who refuses to let go. But she has a chance at a new, experimental life-extension technique that scrubs out the old, regenerates withered tissues, renews the brain, and turns her back into a kid again.

Well, not quite. She's lost some memories, but she retains enough so that her regained youth can be experienced through an older consciousness. But the hormones are raging again, she's brim-full of pep, she's ripe for action, and she wastes no time in escaping the California medical center where she is expected to act like a proper great-grandmother and cooperate decorously with the researchers' need to study the results of their work.

Off she goes, to infiltrate the youth culture, roam Europe, sleep with artists, and try to become a photographer. Her adventures provide a tour of

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a world that has changed in some ways but has also returned to a past mode of wanderjahrs and rebellious artists. And in the end we learn that the sort of youth she has regained is not really what the researchers who treated her had in mind. They view her as a failure and the technology is dropped.

So. Youth is wasted on the young, but most of the old wouldn't know what to do with it if they had it. If that's what Sterling is saying, he's an awful cynic. He's probably also right. Very few people of any age have the "holy fire" of his title, the creative passion for life that makes youth worth restoring.

The second volume in David Brin's new Uplift trilogy (which began with *Brightness Reef*) is now out. It's **Infinity's Shore**, and it easily fulfills all the expectations raised by its predecessor while making great promises for volume three. Don't miss it.

The Uplift idea has impressed me from the start, for it seems very likely that when a species becomes technologically capable of redesigning other species, it will do so, even to the point of creating—"uplifting"—new intelligences to stand beside their makers or "patrons" as at least potential equals. From this basic idea, Brin has created an intergalactic culture in which species trace alliances and kinships to shared patrons, owe debts of service and wealth to those patrons, and recognize that even patrons once had patrons of their own, all the way back to the fabled Progenitors.

Humans seem to be an exception, self-evolved without aid, bursting upon the intergalactic scene as a "wolfling" species with the colossal nerve to uplift its own client species, chimps and dolphins. Their mere existence well and truly upsets the applecart full of traditions that has dominated everyone else for many millions of years. Some folks want to stomp us flat. Some want to adopt us, incidentally gaining a very promising slave. A very few seem willing to let us be.

A few humans flee to the fallow world of Jijo, abandoned (with its entire surrounding galaxy) by civilization to recover its resource base and evolve new potential client species. There they find a handful of other species, refugees from bitter rivalries and persecutions, bent on the Path of Redemption, devolution to pre-Uplift status. The humans bring a different attitude and spark the formation of a remarkable multi-species culture, a paean to diversity.

Meanwhile, back home, the dolphin-crewed *Streaker* has aroused the wrath of all the mighty star-clans: It has found a mothballed armada of ships that just may belong to the Progenitors. *Everyone* now wants *Streaker*, both to punish the Terran upstarts and to claim the treasure it discovered. Its narrow escapes were recounted in *Startide Rising* (1983). Now it has come to Jijo, and we met it at the end of *Brightness Reef*, when it captured four children of four species, who had ridden a hollow-log submarine into the depths to retrieve ancient devices to help defeat a pirate raider.

The pirates were pretty well

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whipped last time. This one begins with another raid, by a quite overwhelming power, a battleship of the arrogant Jophur. These are alien Nazis, bent on exterminating one refugee species, enslaving another, and capturing the hidden *Streaker*. Despite their power, however, the locals inflict considerable damage before the Jophurs are led offstage at the end.

As I said last year, Brin "is a master of plot and character and incident, of sheer storytelling, while he is also thoughtful enough to satisfy anyone's craving for meat on those literary bones." What I revealed above is the merest glimpse of what goes on in the 500 pages of *Infinity's Shore*; I hope it's enough to make you want more.

And the third volume? There are a few clues here to make me stick my neck out and predict that Brin is going to tell us that the Uplift culture is but a splinter off something much grander. It has lasted for eons. It fallows used-up worlds and galaxies. But there is something about the time 150 million years ago that bears special significance, an ancient glyph in the files of the Galactic Library seems to refer to a very different cosmic setting, and there is that fleet of ancient ships.

The "something grander" I suspect is a culture that fallows entire galactic clusters. And that fleet was carrying refugees much like those that settled on Jijo.

Whether I'm right or wrong, there are few who can match Brin for sheer breadth of vision.

Valerie J. Freireich has earned kudos for her "Polite" Harmony of Worlds," a far-future interstellar civilization whose guiding philosophy is Jonism—an anti-religious, anti-superstitious doctrine that stresses rationality and order above all. Two novels have stressed that in the name of reason, people can be pretty unreasonable, for they are ruled by deep-down emotional biases.

She's still playing with that basic idea in her latest, **The Beacon**, now saying that those emotional biases don't have to fit the pattern we know so well. The setting is a future Earth whose people have survived several periods of plague, or Great Dyings. The diseases remain, and they still kill, but thanks to natural selection they are much weaker and people are more resistant. People are also considerably fewer, and they are very civilized, for there is now a device, the Assembly, that permits everyone to gather mentally in a sort of cyberspace or World-wide Web, share information, thought, and feeling, get a rush, and find consensus. A few people, such as Stefan Acari, serve as Judges of the Open Court, rooting out injustice wherever they find it. They are backed up by the forces of Independent Defense (ID), a sort of police force. The Assembly is ruled by the Adjusters, who live in it all the time. Strangely, the language one uses to contact the Assembly and use its various functions is based on images and emotions.

Now meet the Travelers, four humans come to Earth from a vast Ship parked out by Jupiter. They are, Freireich tells us soon enough, the descendants of abductees. The Ship be-

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longs to the Friends, who feel a deep need for strangeness, for contact with aliens; they are as xenophilic as humans are xenophobic, and they collect abductees, exposing themselves to the diseases they carry and conversely exposing the worlds they visit to the diseases they have collected with previous abductees. Guess what caused the Great Dyings. They communicate across species barriers by a kind of song, all emotion and image.

The Travelers are watchful: Are they going to get sick from Earth's diseases? Will Earth's humans get sick from the germs they carry? Or has enough time passed for selection to have made adjustments, to make contact survivable? If it is safe, they will call the Beacon, which will turn off the Assembly and bring the Ship to Earth.

Judge Stefan Acari first meets one Traveler, Beatrice, at a party. When she is later kidnapped, he is drawn into a political tussle in which the Assembly's Adjusters seem to be taking an unusually tyrannical part. He, for instance, is barred from the Assembly, his dedication to truth and justice now unwelcome. A childhood acquaintance, bitter and jealous and amoral, is now the ID agent in charge of the Travelers, hunting for treason, punishing dissent, gloating over pain.

If I say much more about the plot, I will say too much. I will add only that *The Beacon* is an interesting tale, well told, with some thought-provoking things to say. You'll enjoy it.

SCIENCE FICTION ON THE WEB

A new wrinkle in electronic publishing is Ken Jenks's "Mind's Eye Fiction" at http://Tale.com/Titles.htm. Visit that Internet site, and you will see a list of short stories—both new and old—by Spider Robinson, Jack Nimersheim (of whom Jenks says "I can't figure out why [he] isn't better known"), Greg Costikyan, Nancy Etchemendy, Marianne J. Dyson (familiar to readers of these pages), A. L. Sirois, Fred Saberhagen, Jenks himself, and others of lesser renown. I'm in there too, with my old "Howie & the Mayor" series, two stories of which ("Mood Wendigo" and "Downeast Encounter") appeared in these pages way back in 1980. And ever since Spider told the membership of the Science Fiction and Fantasy Writers of America about Mind's Eye, the queries have been pouring in. Expect the roster to grow rapidly—and not just in SF, for Mind's Eye offers African-American fiction (e.g., Ginger Whitaker), fantasy, romance, mystery (e.g., Billie Sue Mosiman), and horror (e.g., Mary Soon Lee) as well.

How does it work? Click on a story title, and you can read the first half of it for free. If you want to finish it, you will have to part with a small sum, typically fifty cents for anything under 5,000 words (a short story), a dollar for anything longer. For the price of a magazine issue or a paperback anthology, you can have the same amount of material, but *you* get to pick the table of contents.

Who wrote the classic *Cosmic G-Strings*? What has this author been up to lately? Haven't a clue? Want to know?

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several indices to SF. If you have a computer and Internet access, you can visit http://www.sff.net/locus/, where you will find Charles N. Brown's and William G. Contento's *Science Fiction, Fantasy, & Horror: 1984-1996,* the bibliographic index to all the SF books, anthologies, and magazines published between 1984 and June 1996. It combines the annual volumes from Locus Press with new data for 1992-1996 and can be searched in several ways, including by author and title. There is also a link to the older anthology and collections index (corrected and expanded from two G. K. Hall volumes) at http://www.best.com/~contento.

Is it any good? I visited and found its search capability as slick as one expects on the Net. Coverage seems pretty complete, too, though—as we all know, Murphy is the Supreme Ruler of the Universe—there have to be errors and omissions in there somewhere. ■

"I can't do it" never accomplished anything; "I will try" has performed wonders.

—George P. Burnham

No man ever became great or good except through many and great mistakes.

—William E. Gladstone

People could survive their natural trouble all right if it weren't for the trouble they make for themselves.

—Ogden Nash

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Stan,

Ya done it again! In the June 1996 issue, in your editorial comment under the title of Ben Bova's "Appointment in Sinai," you stated, "Nobody foresaw that millions would watch on real-time TV when people first walked on another world."

Actually, I did. The time, ca. 1953; the place, West Side Jr. High School, Little Rock, Arkansas, in Mrs. Popperfuss' eighth grade English class. The circumstances: I was commenting during a class talk about an absurd article in a (then) recent issue of *Science Digest,* in which the author stated flatly that "compatible color TV would never be possible." (For those of you born after 1955, "compatible color" meant a signal that could be transmitted in color yet received by both color TVs and B&W TVs—by the way, the standard for all of today's, hundreds of millions of TV sets.)

My comment (with all of the confidence of an eighth-grade adolescent who was one of the few SF fans in the whole state) was, "Of course we will have compatible color TV. In fact, we'll watch the first Moon landing on color TV!" In retrospect, of course, I was not totally correct. The *first* Moon landing we watched in B&W; color only came later.

I mention this because I was quite proud of that particular prediction and, like everyone else, was absolutely stunned when it actually happened.

ARLAN ANDREWS, SR.
MuSE Technologies, Inc.
Albuquerque, NM

(By the way, check out the web site at www.musetech.com)

Dear *Analog,*

Thanks again for a great issue—I always enjoy the double issues! However, in "Boneheads" (July 1996) I got a sinking feeling when I realized that the good doctor was going to feed his colleagues cycad starch! I am fairly sure that cycad starch was found to be the cause of a neurological disorder with symptoms similar to Parkinson's disease. It takes quite a long time to develop—around 30 years or more, if I remember right. People also noticed that insects won't touch cycad starch. So it seems like a pretty dangerous solution to the colony's food problems!

Anyway, *Analog* is still the best SF magazine around, and I've been reading it (and *Astounding*) for about 40 years, so keep up the good work!

PAUL MORRISON
105 Jimston Drive,
Markham, Ontario, L3R 6R2
Canada

It's true that cycad starch can cause such problems—as "Boneheads" explicitly acknowledged. It's also true that that of at least some

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species can be and sometimes is made edible by appropriate processing. The good doctor's solution might not have been the most desirable one, but it was the only one anyone had yet found. So it's definitely an improvement until (unless) something better comes along.

Dear *Analog*:

Your comments on the CompuServe censorship fiasco were very much to the point, and though it's since been resolved, there were a few other nasty points about it that you didn't mention.

One is that CompuServe waffled about it the entire time, giving out false information and contradicting its own news releases. To this day they refuse to answer questions about the incident.

Because of the way the newsgroups were chosen to be censored (it was not a list given to them by the German government)—they censored many newsgroups that weren't pornographic—several support groups for disabled people, gays and lesbians, teenagers, and victims of abuse, along with at least two television fan-club newsgroups and a few boards offering only news summaries. These newsgroups didn't offer any pictures at all, since they are merely message-exchange boards. Even the text of the messages in these groups was not pornographic or obscene.

In addition, the German government made the same mistake as the US Congress—assuming that, since computers use a television-like monitor, the pornographic pictures they were after flashed across the screen like so many commercials. Anyone who used a computer at that time knew that finding a picture, downloading it, and getting it up on the screen with a viewer program was a multi-step process that took several minutes at best, and wouldn't happen by accident—the user had to deliberately choose to do it. (Since the January 1996 censorship, the World Wide Web, with its much-faster graphic downloads, superseded the Internet newsgroups. One still has to search, however.)

CompuServe's solution was to offer parental-control programs that supposedly restrict children's access to Internet sites that the parents consider off-limits. The sad part is that CompuServe continues to push "pornographic" material with no parental-control warning while slapping the warning on non-pornographic things like political discussions and discussions of evolution.

There are a lot of lessons to be learned from this incident—including some on customer relations. The Supreme Court decided that Congress's attempt at censorship of the Internet was unconstitutional, in a very clearly-worded decision strongly supporting First-Amendment freedom of speech.

KEN MOSES
102225.1412@compuserve.com

Dear Dr. Schmidt:

I found that your editorial "I/O" in the August issue touched upon some of my own experiences in teaching. In the late 1970s I was a student at the Faculty of Education at York Universi-

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ty in Toronto. As part of the program each student was assigned a public school at which he or she did a one day practicum every week. To assist us with our practicums there were classes about the theory and practice of teaching. Two such classes dealt with the input/output problem that you discuss in your editorial. I'd like to say up front that if literature was cited for the statements I'm about to repeat, I didn't write it down at the time. I can only assume that the references were of the "studies have shown" variety.

In a class about preparing lesson plans we were told that human beings take in information, i.e. they "learn," in one of three ways: by seeing it, by hearing it, by writing it down. In preparing to present material to our classes, for example, we should be careful to write things on the board, talk about it while writing, and have the students take notes. This way, not only did each input channel reinforce the others—a point you yourself noted—but we would be sure to hit upon at least one that worked for each student. Notice the implication. When questioned, the lecturer explicitly stated that some people learn only, or learn best, via a single input channel.

My experience in private tutoring has been that this three-part approach actually does work. Many of my students claim to be able to understand something for the first time after I have explained it. I suspect that I have merely used the input channel that works for them. Of course, I never use multiple choice exams. I examine my students by requiring them to provide answers to questions either verbally, or in writing, or both. Since I teach literature and writing, this seems to work.

The class about teaching reading was a good example of what we had been taught about input channels. It was no accident, we were assured, that reading and writing are taught simultaneously. A couple of points interested me in this class. The first was that while we knew that being able to read was the result of drilling students in letter sounds and combinations, we didn't know why this happened (i.e. what change took place in the brain) only that it did happen. Basically, if you drill the kids long enough, suddenly they will be able to read. We know what works, we just don't know why it works. This "it jest growed" attitude annoyed me greatly at the time, and I wonder if any more is known about it now?

Second, it was explicitly stated in the class that the brain's capacity to accept the input that would lead to the ability to read was often a limited one. That is, that after a certain age, which did vary slightly, some people simply became unable to learn to read. Their window would have closed. This, in turn, would affect their available input channels in that they could only take in information visually (pictures), or aurally. Similarly, I seem to remember reading that feral children cannot always be taught to talk or read.

Once again, I have no articles to cite for any of this information. Your second to last paragraph does indicate, however that there may be more

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up-to-date information on the detailed neurophysiology of input and output systems than was available years ago. I would appreciate it if you or your readers could provide some suggested reading.

Once again, thank you for a stimulating editorial and a wonderful magazine.

VIOLETTE MALAN, PH.D.
RR 2 Elgin,
Ontario, KOG 1E0
Canada
vmalan@octrf.on.ca

Dear Mr. Stine;

I thought I'd offer some thoughts on your essay "Been There, Done That, But Should We Do It Again?" in the August issue. The last time I looked up the figures fifteen years ago, the inland waterways actually carried more tonnage than the rail and road systems combined. A string of barges and a tugboats are more fuel efficient than a railroad. While roads and railroads must be constructed from scratch, rivers and lakes are there already. So long as they run in the right direction, one simply needs to build locks at places like Niagara Falls and improve the channel in places. Building something like the St. Lawrence Seaway is more efficient than off-loading cargo and shipping by rail. The state and federal governments have been involved in canal building since 1791.

The railroads in the USA were built with the idea of opening a route quickly and building a permanent track later. The problem is there was never enough money to rebuild the tracks. By the 1950s the government was faced with the choice of either subsidizing road construction or the reconstruction of the railroads. They chose roads. It's worth noting the auto industry tried to finance a national highway first. The Lincoln Highway was supposed to be constructed with donated funds and local labor. That didn't work.

Assuming a new planet has rivers, it makes more sense to settle along the river and build canals or roads where needed than railroads. Passenger traffic could travel by air. However, unless really fuel-efficient aircraft are developed, I can't see large amounts of grain, coal, and iron ore traveling by air. One needs huge amounts of steel to build a railroad. A simple road can be built of crushed stone and one semi-tractor can pull four or five trailers (i.e. road trains). Why would we build railroads as we normally think of them on a new planet? Why build them in California, for that matter? Solar-powered microlight aircraft are not science fiction. They have been a reality for twenty years. Outlaw passenger cars and turn the parking lots into runways. Light passenger railways and subways are only economically viable in areas with high enough population densities. This isn't England or Japan.

JIM RITTER
Montrose, MI

The author replies. . . .

Dear Stan:

I really don't understand what James C. Ritter is saying in his comment on my science-fact article, "Been There, Done That, But Should

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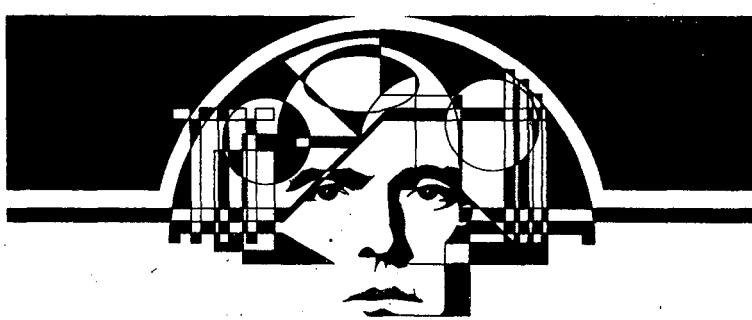
We Do It Again?"

I was pointing out some historical systems that had been used to finance some of the transportation systems of the past, asking space advocates to undertake a careful reading of history before they reinvented the square wheel in financing space transportation.

Mr. Ritter goes clearly off-scale in suggesting that we rebuild nearly everything in our transportation matrix. He misses the point that, although there are far more oxcarts in the world than airplanes, airplanes move far more cargo and passengers. His use of the word "simple" in describing how to rebuild our transportation network reveals that he's not been forced to deal with environmental-impact statements. Turn parking lots into runways? A 10,000-foot runway made from a K-Mart parking lot is not only going to disturb the neighborhood but will play merry hell meeting the standards of the FAA. As for solar-powered microlight aircraft, they don't fly very well at night or in bad weather . . . and don't fly very well, period, because most people don't know how to think in three dimensions. In the USA, there are only about 730,000 qualified pilots, about the same number of people who hold driver's licenses in Phoenix, Arizona.

G. HARRY STINE ■



Attention CompuServe customers: have you visited our Forum? GO SFLIT, select "Messages" and then "Browse" down to Section 17, ANALOG & ASIMOV'S MAGS, to see what's coming up in future issues. You can participate in discussions and debates with fellow readers, and even a few of our authors, who make regular appearances; comment on editorial material; participate in contests; and much more. Don't miss it!

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UPCOMING EVENTS Anthony Lewis

15–17 March
CONAMAZOO FOUR (Michigan area SF conference) at Stouffer Battle Creek Hotel, Battle Creek, MI. Guest of Honor—Pamela Dean; Filk Guest—Steve MacDonald. Registration: $20 until 14 February, $25 thereafter. Info: Conamazoo Four, Box 1546, Evanston, IL 60201-1546. Phone: (708) 328-8765. E-mail: conamazoo@tezcat.com URL: http://www.tezcat.com/~erik/zoo.shtml

19–23 March
INTERNATIONAL CONFERENCE ON THE FANTASTIC 1997 (Academically oriented SF/Fsy conference) at Airport Hilton, Ft. Lauderdale, FL. Guest of Honor—Dan Simmons; Special Guest—Chelsea Quinn Yarbro; Perpetual Special Guest—Brian W. Aldiss. Info: IAFA, College of Humanities, 500 NW 20th HU-50, B-9, Florida Atlantic University, Boca Raton, FL 33431. (407) 532-1495.

21–23 March
MIDSOUTHCON 16 (mid-South SF conference) at Memphis, TN. Guest of Honor—John DeChancie; Artist Guest of Honor—Mitchell Bentley; Fan Guest of Honor—Cullen Johnson. Registration: $25 until 1 March. Info: MidSouthCon 16, Box 11446, Memphis, TN 38111. Phone: (901) 274-7355. URL: http://www.watervalley.net/midsouthcon

27–30 March
NORWESCON 20 (Seattle-Tacoma area SF conference) at Red Lion Hotel, SeaTac Airport, WA. Artist Guest of Honor—Vincent Di Fate; Science Guest of Honor—Robert L. Forward. Registration: $50 at the door. Info: Norwescon 20, Box 24207, Seattle, WA 98124. Phone: (206) 270-7850. E-mail nwc@eskimo.com

28 August–1 September
LONESTARCON 2 (55th World Science Fiction Convention) at San Antonio Convention Center, San Antonio, TX. Guests of Honor—Algis Budrys and Michael Moorcock; Artist Guest of Honor—Don Maitz; Fan Guest of Honor—Roy Tackett; TM—Neal Barrett, Jr. Registration until 31 December 1996: $120; supporting $25; children +3 to +12 $40; children -0.75 to +3.0 FREE (age as of 29 August 1997). This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Info: LoneStarCon 2, Box 27277, Austin, TX 78755-2277. Voice: (512) 435-7446; fax: (512) 435-7747; e-mail: lsc2@io.com

Convention attenders: When calling conventions for information, do not call collect and do not call too late in the evening.

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TECHNOLOGY UPDATE

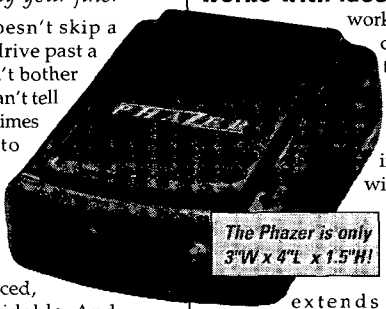
How to make your car invisible to radar and laser...*legally!*

Rocky Mountain Radar introduces a device guaranteed to make your car electronically "invisible" to speed traps—if you get a ticket while using the product, the manufacturer will pay your fine!

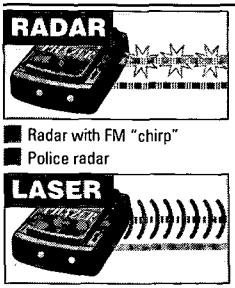
■ *The Phazer will "jam" both radar and laser guns, preventing police from measuring your speed.*

If your heart doesn't skip a beat when you drive past a speed trap, don't bother reading this. I can't tell you how many times it's happened to me, even if I wasn't speeding.

It seems with speed-detection technology getting more advanced, tickets are almost unavoidable. And although devices exist that enable motorists to detect these speed traps, they are outlawed in many states...including mine.



The solution. Today, Rocky Mountain Radar offers a solution—the Phazer. Combining a *passive* radar scrambler with an *active* laser scrambler, it makes your automobile electronically "invisible" to police speed-detecting equipment.



■ Radar with FM "chirp"
■ Police radar
■ Special infrared with "noise"
■ Police laser

HOW TO MAKE YOUR CAR DISAPPEAR

Radar and laser scramblers are devices that foil speed traps by making vehicles electronically "invisible" to police radar. Radar and laser scramblers mix a portion of the signal with background clutter and reflect it back to the squad car. This technique creates an unreadable signal that confuses the computer inside the radar gun.

How it scrambles radar. Police radar takes five to 10 measurements of a vehicle's speed in about one second. By mixing an X, K or Ka radar signal with an FM "chirp," the Phazer sends one signal that tells the radar the car is going 15 m.p.h. and another signal that the car is going 312 m.p.h. Because police radar can't verify the speed, it displays no speed at all.

■ *The Phazer makes your car invisible to police radar and lasers or the manufacturer will pay your speeding ticket!*

Works with laser, too! The Phazer also works against Lidar that use the change in distance over time to detect a vehicle's speed. The Phazer uses light-emitting diodes (LEDs) to fire invisible infrared pulses through the windshield. This gives a false indication of the car's distance, blocking measurement of your speed. Its range of effectiveness extends from as far as three miles to almost 100 feet away from the trap.

Ticket rebate program. Rocky Mountain Radar is so confident that the Phazer will work that if you do get a speeding ticket within the first year while using the Phazer, they will pay your fine if the speed limit was not exceeded by more than 30%, or 15 miles per hour, whichever is less.

Risk-free. Try the Phazer. It's backed by our risk-free trial and three-year manufacturer's warranty. If you're not satisfied, return it within 90 days for a "No Questions Asked" refund. Best of all, unless you live in Minnesota, Oklahoma or Washington, D.C., using the Phazer is completely within your legal rights.

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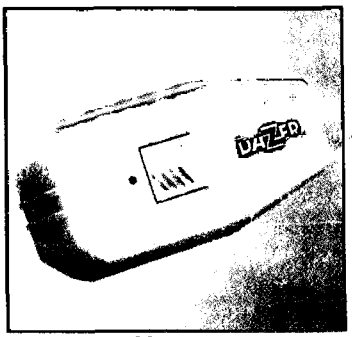

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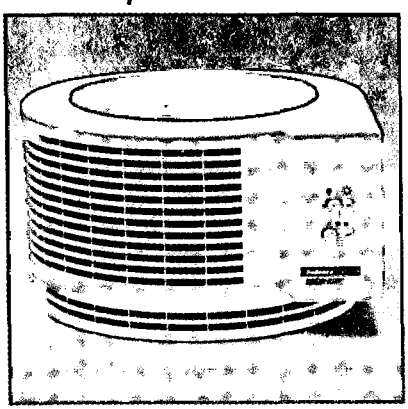

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